THE UNIVERSITY
OF ILLINOIS
LIBRARY
630.5
AH
v.18-19

REMOTE STORAGE

Digitized by the Internet Archive
in 2014

https://archive.org/details/journalofagricul1819unse

The JOURNAL of AGRICULTURE

AND HORTICULTURE

Volume 18 *July 1st 1914* *Number 1*

GRADUATING CLASS IN AGRICULTURE, MACDONALD COLLEGE, JUNE 1914.

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

CONTENTS

EDITORIAL. — Publications on Agriculture; Death of Father Edouard; The Pontiac Wool Association; Eastern Townships and the Immigration Question; Lessons from the Drought; Ruralizing the Cities; Progress of Household Science; Drift of Population in the Eastern Townships and Ottawa valley; New B.S.A.'s from Macdonald College; Prices Slightly Downward.

ORCHARD AND GARDEN. — Quebec Fruit Prospects; Irrigation for the Market Gardener; Garden Notes for July; Producing the Best Grade of Honey.

FARM AND FARM CROP.—Field Husbandry Experiments; Agriculture in Pontiac county; Back-to-the-Land Movement; Megantic County Farmers at Macdonald College; Lifting Water from Brook to Kitchen; Power for Grinding; Supplying Water from Spring; Illustration Farm of Thos. McDowell.

LIVE STOCK.—The Bacon Industry in the Province of Quebec; The 1914 Wool Clip; The Queen of the Dairy World; The Ormstown Spring Show; A Great Holstein Bull; Official Records of Holstein-Friesian Cows; Record of Performance Test, Ayrshire Cows; Encouraging Wool Growing;

DAIRY.—Disinfection of Creameries and Cheese Factories; Inspector of the Weighing of Butter and Cheese Appointed; Cleanliness in the Dairy; Milk per Acre; Six Months' Hoist; Individual Fair Play; The Manufacture of Camembert Cheese in Canada; Cost Reducers; Quack Grass.

POULTRY.—A House for Laying Hens; A New Breed; English Layers; Demonstration Houses; Marketing Broilers in Quebec; Preserving Eggs in Waterglass; Egg-laying Ability is Inherited; Poultry House Prints.

WOMAN'S WORLD. — Homemakers' Club at Canterbury; Homemakers' Club at Eardley; Waterloo Woman's Club; Foods and Food Preparation; The Children's Homer.

GENERAL INTEREST.—The Value of a Pure-bred Sire; The Co-operative Movement in Denmark; The Origin and Distribution of Wheat; Possibilities of a Modern Maple Grove; Simple Sidewalk Construction for Farms; Takes the Backache out of Housework; An Experiment with Tuberculosis; Economical Milk Production, etc.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

three generations on the average. Virility is maintained by the constant influx of country men and women.

The plan of large suburban areas would tend to meet the needs. It would take the people back to the land where they can live a more normal life, and where families can be brought up amid healthy surroundings.

PROGRESS OF HOUSEHOLD SCIENCE

AT the recent closing exercises of the School of Household Science at Macdonald College, Miss Fisher, Head of the School, said, among other things, that the demand for graduates, was rapidly increasing, especially in the hospitals of Canada. In addition to the work carried on in the school, a successful endeavor was being made to get in touch with the housewives of the rural districts by the formation of clubs, which were visited by Miss Campbell, the demonstrator, who advised the members in the preparation of programmes. These clubs did not confine themselves to studying domestic science, but took up movements for the well-being of their communities, among their activities being the establishment of rest rooms in the villages and towns for the farmers' wives and daughters, and the improvement of rural schools. For the benefit of these clubs a travelling library of 140 volumes had been secured, while the school also offered a short course every February for club members and others.

DRIFT OF POPULATION IN EASTERN TOWNSHIPS AND OTTAWA VALLEY

A comparison of the Census Reports of 1901 and 1911 affords an interesting study of the drift of population in the Eastern Townships and the counties of the Ottawa valley. Let us first consider the southern border counties of Compton, Stanstead, Brome, Missisquoi, St. Johns-Iberville, and Huntingdon. The following table (I) shows the number of English speaking and French-speaking residents, and the rural and urban population. For this group of counties it will be seen that with the exception of St. Johns-Iberville there has been an actual decrease in the number of English-speaking people in every county during the ten-year period between 1901 and 1911; while there has been an increase of French-speaking people in every county. The total English-speaking population has decreased 4336, and the French-speaking population has increased 8705 during the decade.

Rural population increased in Compton and Missisquoi, but the total rural population decreased 637 during the decade.

TABLE I

		English speaking.	French speaking.	Rural	Urban
Compton,	1901,	11,562	14,460	21,521	4,939
	1911,	10,477	18,714	23 030	6,600
Stanstead,	1901,	9,959	8,744	10,201	8,797
	1911,	9,794	10,655	9,898	10,867
Brome,	1901,	8,217	4,766	10,761	2,636
	1911,	7,759	4,977	10,758	2,458
Missisquoi	1901	7,323	9,908	10,278	7,061
	1911,	5,958	10,479	10,363	7,103
St. Johns and Iberville,	1901,	1,260	18,141	15,137	5,542
	1911,	1,881	19,632	14,074	7,808
Huntingdon,	1901,	7,971	5,105	12,519	1,460
	1911,	6,557	5,372	11,662	1,578

Let us examine similarly the next row of counties, viz., Richmond-Wolfe, Sherbrooke, Shefford, Rouville, Napierville, Chateauguay and Beauharnois (Table II).

In this group of counties, which are closer to the St. Lawrence, the English-speaking population increased in Sherbrooke and to a slight extent in Laprairie-Napierville and Beauharnois, while the French-speaking population decreased in Rouville, Beauharnois and Laprairie-Napierville during the decade. Taking this group as a whole the English-speaking population decreased 6491, and the French-speaking population increased 6297 during the decade.

The rural population increased only in Richmond-Wolfe and Beauharnois, and the total rural decrease is 3692 during the decade.

TABLE II.

		English speaking.	French speaking.	Rural	Urban
Richmond and Wolfe,	1901,	8,242	25,697	25,359	8,778
	1911,	7,249	31,937	25,375	14,116
Sherbrooke,	1901,	7,456	10,645	5,541	12,885
	1911,	8,331	13,947	4,825	18,386
Shefford,	1901,	5,390	18,086	16,550	7,078
	1911,	4,587	19,214	15,368	8,608
Rouville,	1901,	484	15,458	10,594	2,813
	1911,	320	12,737	10,042	3,089
Laprairie and Napierville,	1901,	546	16,890	16,328	3,305
	1911,	549	16,503	15,235	4,100
Chateauguay,	1901,	4,480	9,415	12,742	841
	1911,	3,642	9,607	11,940	1,382
Beauharnois,	1901,	2,119	19,506	8,701	13,031
	1911,	2,135	18,049	9,338	11,464

(Note: 1901 Sherbrooke City.. 11,765
1911 Sherbrooke City.. 16,405
1901 Valleyfield.. 11,055
1911 Valleyfield 9,449

Next, let us turn to the counties in the Ottawa Valley, viz., Argenteuil, Labelle, Wright and Pontiac (Table III.)

In the Ottawa Valley counties the English-speaking population decreased in every county, while there was a strong increase in the French-speaking population in every county. The total decrease of English-speaking people is 3,093, and the total increase of French-speaking people is 9,971 during the decade.

The rural population increased in Labelle and Pontiac counties, and the total increase of rural population is 3798 during the decade.

TABLE III

		English speaking.	French speaking.	Rural	Urban
Argenteuil,	1901,	8,846	7,391	13,657	2,750
	1911,	7,919	8,559	12,788	3,978
Labelle,	1901,	5,265	24,653	26,861	6,040
	1911,	4,882	34,016	29,640	10,711
Wright,	1901,	13,917	29,946	24,963	17,867
	1911,	13,034	34,373	24,404	23,928
Pontiac,	1901,	14,221	9,397	22,221	3,501
	1911,	13,321	14,270	24,668	4,748

In the group of "Other Counties", Table IV, the English-speaking people increased in Chambly-Verchères, Gaspé, Terrebonne, and Vaudreuil, and the French-speaking people increased in every county except Drummond-Arthabasca.

The total English increase for this group is 900 and the total French increase is 7866.

There was a rural increase in Quebec Co., Gaspé, Terrebonne, and Vaudreuil, the total increase for the group being 3172.

TABLE IV

		English speaking.	French speaking.	Rural	Urban
Chambly-Vercheres,	1901,	1,877	22,269	16,600	7,718
	1911,	3,909	24,115	14,615	14,100
Drummond-Arthabasca,	1901,	3,293	41,045	33,329	5,670
	1911,	2,317	39,165	32,431	9,159
Megantic,	1901,	4,860	18,721	18,315	5,563
	1911,	4,195	26,761	18,025	13,289
Quebec Co.,	1901,	2,935	18,710	20,546	1,555
	1911,	2,834	22,428	22,539	3,305
Gaspé,	1901,	7,559	22,785	30,229	454
	1911,	7,660	27,127	34,395	606
Terrebonne,	1901,	1,289	25,424	18,628	8,188
	1911,	1,740	26,715	19,029	9,989
Vaudreuil,	1901,	1,055	9,352	8,114	2,331
	1911,	1,112	9,861	7,899	3,140

SUMMARY

		English speaking.	French speaking.	Rural	Urban
Southern Border Counties,	1901,	46,792	61,124	80,417	30,435
	1911,	42,426	69,829	79,780	36,414
Next Row (North) Counties,	1901,	33,304	115,697	95,815	48,731
	1911,	26,813	121,994	92,123	61,145
Ottawa Valley Counties,	1901,	42,249	71,387	87,702	30,158
	1911,	39,156	91,218	91,500	43,365
Other Counties,	1901,	22,868	158,306	145,761	31,479
	1911,	23,767	176,172	148,933	53,588

THE GARDEN AND ORCHARD

QUEBEC FRUIT PROSPECTS

THE Dominion Fruit Commissioner under date of June 15th makes the following report regarding fruit prospects in the Province of Quebec:

Prospects better than for several years past. Excellent bloom and no frost. Some drop on account of drouth. Wealthy trees promise a very heavy crop, and Fameuse and McIntosh a good crop. No trouble from caterpillars except in Rouville and Huntingdon. Strawberries came through the winter well, but drouth is shortening the crop. Slight winter killing of raspberries.

IRRIGATION FOR THE MARKET GARDENER

THE market gardener of to-day finds that if he would produce the maximum on his land he must depend on other means than nature for the moisture which is absolutely essential to the growth of plant life.

For the past few years there has been a certain season in the year when no rain fell. Generally this time is when the crops are germinating or just through the ground. This year we have had little rain since the middle of April, then only in heavy dashes which did no good. One man at the Ontario Convention of Vegetable Growers' in Toronto, last November, stated that he would be compelled to go out of business without his irrigation system. One man in Toronto has spent $1000.00 to bring the water only as far as his gate and must spend another large sum to distribute it over the fields. But he realizes that the money is well spent.

This, then, leads us to seek for information regarding systems of water distribution. There are four in use at the present time: Furrow, Sub-irrigation, Campbell Sprinkler and Skinner. These I shall try to explain in detail:—

(1) *Furrow System*:—

This system consists in running a furrow beside the plant row with a hoe or garden plow, letting the water run down in it. This system is cheap and easily used but is wasteful of water, lacks greatly in uniformity of distribution, the plants at the upper end of the row being flooded while the ones at the lower end are very dry, and lastly causes baking of the soil and fosters the growth of weeds.

(2) *Sub-irrigation*:—

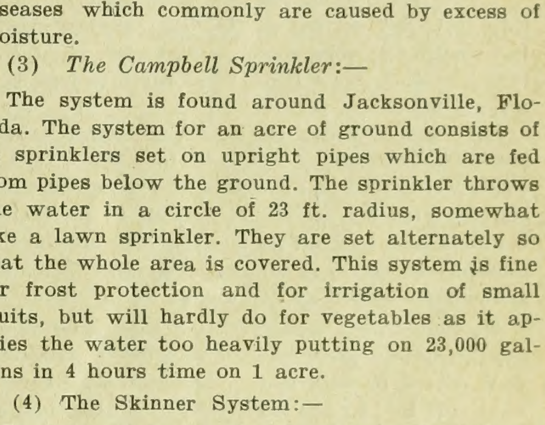
This means the laying of rows of 2½" tile in the field, 8 to 15 ft. apart, the tile being 4 inches to 2 ft. below the surface, depending on the soil (the heavier the soil the nearer the surface and the closer the rows are together). This system prevents evaporation, requires less tillage, and causes no baking of the soil, but is very expensive and must be taken up each fall through danger of frost. It is very good for greenhouse work on crops like tomatoes and lettuce as it prevents many of the diseases which commonly are caused by excess of moisture.

(3) *The Campbell Sprinkler*:—

The system is found around Jacksonville, Florida. The system for an acre of ground consists of 14 sprinklers set on upright pipes which are fed from pipes below the ground. The sprinkler throws the water in a circle of 23 ft. radius, somewhat like a lawn sprinkler. They are set alternately so that the whole area is covered. This system is fine for frost protection and for irrigation of small fruits, but will hardly do for vegetables as it applies the water too heavily putting on 23,000 gallons in 4 hours time on 1 acre.

(4) The Skinner System:—

The last and best system is made by the Skinner Irrigation Co., of Troy, Ohio. This system is in use in many parts of Ontario and is to be seen here at Macdonald College. It consists of parallel rows of pipe set from 40-55 ft. apart according to the amount of water pressure the grower has. In the pipe are nozzles every 3-4 ft. which throw the water in a fine spray, that gives the system its common name—Mist System. Where the laterals are attached to the main feed pipe there is a special union which allows the lateral pipe to rotate completely round. The water may be applied at



Tomato blight. Use Bordeaux mixture.

Total for	1901,	145,213	406,514	409,695	
Groups above,	1911,	132,162	459,213	412,336	
Total for	1901,	580,338	1,322,115	992,667	656,231
Province,	1911,	632,206	1,605,339	1,032,618	970,614

		Roman Catholics	Total Population.
Quebec Province,	1891,	1,291,709	1,488,535
	1901,	1,429,260	1,648,898
	1911,	1,724,683	2,003,232

In 1911 93% of the Roman Catholics were French speaking, and 80% of total population were French speaking.

In 1901 92.5% of Roman Catholics were French speaking, and 80% of total population were French speaking.

In 1911 86% of total population were Roman Catholic.

In 1911 there were 30,268 Jews and 1,959 members of the Greek Church in Quebec Province.

NEW B. S. A.'S. FROM MACDONALD COLLEGE

June 9th 1914

THE following students have completed their fourth year and have been granted the degree of Bachelor of Science in Agriculture by McGill University.

(Names in alphabetical order).
General Proficiency.

Blondin, Edouard Napoleon,
Burlington, Vermont, U. S. A.;
Coffin, Caryl Fenn,
Montclair, New Jersey, U. S. A.;
Cooke, Osborne Alvin,
Beech Ridge, Que.;
Cowan, Philip Russell,
Bushley, Tewkesbury, England;
Dougall, Robert,
Pretoria, Transvaal, South Africa;
Drayton, Frank Lisle,
Bridgetown, Barbados, B. W. I.;
Fiske, Hollis Johnson MacLeod,
Florenceville, N. B.;
Hamilton, David Wiley,
Macdonald College, P. Q.;
Hamilton, Richard Iredale,
Levis, Que.;
Hodge, Clarence Herbert,
Cookshire, Que.;
Huestis, Ralph Ruskin,
Red Deer, Alberta;
Husk, Ray Elson,
Ulverton, Que.;
Leclair, Jean Marie,
Ste Thérèse, Que.;
MacFarlane, Wimburn Laurie,
Fox Harbour Point, N. S.;
Moe, George Gordon,
Rockburn, Que.;
Muir, George William,
Howick, Que.;
Newton, William,
Plaisance, Que.;
Reed, Benjamin Trenholme,
Ulverton, Que.;
Ritchie, Thomas Frederick,
Steadman, Que.;
Schafheitlin, Adolf Otto,
Canning, N.S.

FRONT page Illustration.—The illustration on the front page of this issue is from a photograph of this class.

Front row from left — Reed, Muir, Fiske, Drayton, Schafheitlin;

Second row — MacDougall, Husk, Hodge, Wilcox, Durling, Huestis;

Third row — Moe, Coffin, MacFarlane, Ross, Dougall, Newton, Hamilton, Ritchie.

Appointments up to present date.—Reed joins the staff of the New Brunswick Agricultural School at Woodstock;

Fiske is manager of the Cold Storage Co., St. Catharines, Ont.;

Drayton joins the Botanical staff of the C.E.F., Ottawa;

Durling becomes Assistant Demonstrator to Mr. Raymond at Cookshire;

Hodge becomes Demonstrator at Richmond;

Husk becomes Demonstrator at Huntingdon;

MacDougall becomes Assistant Demonstrator at Cowansville;

Moe is Assistant Dominion Cerealist, C.E.F., Ottawa;

Newton goes to British Columbia as Provincial Cerealist;

Hamilton is Lecturer in Nature Study and Elementary Agriculture, School for Teachers, Macdonald College;

Ritchie joins the Horticultural Department, Macdonald College to do Orchard Survey work;

Dougall goes to Cornell University to do post-graduate work.

Cowan is at the C. E. F., Ottawa.

PRICES SLIGHTLY DOWNWARD

THE Department's index number of Wholesale Prices stood at 136.2 for May as compared with 136.8 in April and 134.5 in April, 1913. Hogs, sheep, dairy products, fish, metals, fuel and some lines of lumber were lower in price but grains, cattle and beef, fruits and vegetables, wool and jute showed important advances. Compared with the same month a year ago, the groups: Fish, Dairy Products, Miscellaneous Foods, Metals, Fuel and Furs were on lower levels but advances appeared in the groups:—Grains and Fodder, Animals and Meats, Fruits and Vegetables, Textiles, Hides, Leathers and Lumber.

In Retail Prices the chief feature of the month was a general decline in butter, but potatoes advanced in many of the cities, scarcity being reported. Eggs began to advance. The usual decline in coal in the spring occurred in several localities and sugar was also lower.

The Skinner irrigation system in use.

any time of day as the spray is very fine and causes no injury to the plant or soil. It is easily looked after, as the man can be doing other work in the garden. It gives clean foliage and healthful vigorous growth.

I would like to impress on the reader, however, that irrigation will never take the place of cultivation. The two must go hand in hand if results are to be obtained.

A. H. McLennan,

Macdonald College

GARDEN NOTES FOR JULY

THE late cabbage and cauliflower should be transplanted by now. A little nitrate of soda scattered along the rows near each plant will help it to get settled in its new surroundings. If the weather is very warm, water each plant carefully and then draw some loose earth around it to form a mulch.

One should spray the growing potatoes with poisoned Bordeaux 4 - 4 - 40 formula with 1 lb. Paris Green or 2 lbs. Arsenate of lead added, to poison the growing larvae. It is well to go through the field and pick off as many of the old bugs as possible as they will do much damage before they get enough poison to kill them.

We should have ceased cutting asparagus by now (July 1st). Be sure to give it a heavy coating of well rotted manure and a dressing of nitrate of soda, 100 lbs. to the acre. Give it a thorough cultivation before applying the manure and afterwards see that all weeds are kept cut. Poisoned Bordeaux Mixture with Resin Sticker added (2 lbs. Resin, 1 lb. sal soda crystals, 1 gal. water, boiled for 1½ hours in an iron kettle) will keep down rust and the beetles. This summer during the cutting season many fields have been troubled with the variegated cut worm which destroyed the growing crop. Poisoned Bran mash will overcome these.

Cultivation should be thorough, especially in such a dry season as this year has been. If regularly and carefully done cultivation will take the place of rain to a fair extent.

Many truckers in Quebec and Ontario do not make a practice of rotting manure before applying it to the land. Most of the large growers in the United States are building cement forms in which they rot all their manure. The manure is in so much better shape, the weed seeds are destroyed and the manure becomes a part of the soil so easily that the water holding capacity of the soil is increased.

Spray your Celery and Tomatoes regularly with Bordeaux. Ontario growers to-day find that they must spray if they wish any returns, and why not the same in Quebec? The celery blight problem is one of our most pressing ones. Keep Bordeaux on the plants.

A. H. McLENNAN,

Macdonald College

PRODUCING THE BEST GRADE OF HONEY

LEFT to themselves the bees will, in an average season, produce more or less honey according as they are a strong or a moderate sized colony. The quality of the honey they produce will vary also, depending upon the season of the year in which it is gathered. This last is especially true as regards the comb-honey producer.

The object of the comb-honey producer is to get as many number one sections as possible and to keep down the number of culls as low as he can. A number one section is one which weighs in the close vicinity of 12 1-2 oz. gross, filled with honey gathered from basswood or clover blossoms and which has even white smoothly-capped surfaces extending to the edge of the wood; and lastly, the wood of the section must be carefully scraped to remove all propolis or bee glue. According to this description a number one section of honey may seem to be difficult to produce. If you follow the "let alone" plan of bee-keeping you will secure a certain percentage of number one honey but if you add a small amount of manipulation at the proper time your crop of number one will be doubled and your percentage of culls suffer accordingly. It is a good plan to delay until the beginning of the clover honey flow before putting on sections, if your bees will allow you; sometimes the colonies become strong and show signs of swarming on the light honey flows that proceed the beginning of clover. Strong swarms are very essential for producing comb honey and to check the swarming impulse it may sometimes be necessary to give more room in the way of a super of sections, or if you produce extracted honey, an extracting super. It will be found that on a light flow of honey the bees will be more inclined to stick things up with bee glue rather than draw out comb and put honey in it. It is advisable to use separators for comb honey, i. e., thin strips of wood which divide each section into a compartment by itself, for the reason that the bees will build the combs straighter and more evenly. In preparing the first super to be put on the hive some beekeepers make a practice of putting three or four of their cull sections with drawn comb of the previous year into the super; this tends to attract the bees quicker and consequently gets them at work drawing out the foundation faster. After the honey flow is well under way and the sections in the first super put on are nearly all capped over put on a second one underneath the first. The reason for this is that so long as there are cells of honey nearly ready to cap over the bees will go up and finish them off, and in the meanwhile they are beginning to draw out the foundation in the second super, and once the first one is done the work proceeds without interuption in the second one. If the end of the honey flow from clover or basswood is at hand reverse the order of putting on the supers. Place the new super on top of the nearly finished one, because your object is to get the largest number of finished sections. After the bees have capped and finished a super or half story, as it is sometimes called, remove it from hive. You may find two or three sections not completely finished; take them out and put them in with the next super that you put on the hive. If you are in a locality where there is any buckwheat sown it is advisable to keep a sharp lookout for the commencement of the honey flow from it. Owing to the fact that buckwheat honey has a very brown color a very little of it in a section will tinge the honey to a brown shade. Buckwheat honey has a somewhat coarse strong flavor and although it is preferred by some it sells for a price that is much less than what clover or basswood honey brings. In connection with the clover flow it is well to remember that the blossoms do not as a rule begin to yield nectar until after they have been in bloom six or seven days. A very handy little device to use in taking off comb honey is a Porter Bee escape. This is a small tin contrivance mounted on a wide board, the whole thing costing about forty cents. The board is shoved between the super to be cleared of bees and the hive, and in the course of a day the bees will vacate the super, when it may be taken quietly off without any bother. No smoking is necessary when using it. One of the handiest things to use in scraping sections is a jack-knife with a broken blade projecting about an inch or so. It will be found very handy to get around corners and curves with and is light to handle.

Compared to the comb-honey producer the extracted-honey man has an easier course to follow. His outlay will be slightly greater at first because he will need a honey extractor for separating the honey from the combs and an uncapping knife for

Careful cultivation gives good crops.

THE FARM AND FARM CROPS

FIELD HUSBANDRY EXPERIMENTS

THE Experimental Farm at Ottawa and the Branch Farms and Stations make field husbandry investigations a very prominent part of their work. For the information of those who are interested the more important results of last season's work over the entire system have been summarized and issued in Bulletin No. 75 of the Experimental Farms. It takes up the question of rotation, cultivation, fertilizers, rates of seeding, cost of production, weed eradication and other points connected with field agriculture. The information is presented by Farms and Stations and is, therefore, easily available for study. This bulletin is for free distribution at the Publications Branch of the Department of Agriculture at Ottawa.

AGRICULTURE IN PONTIAC COUNTY

Some Impressions gathered by a Representative of the Journal of Agriculture; A progressive District where Co-operation and Cow-testing are making rapid Headway; Fine Horses and Cattle; An Excellent Record for Cheese-making.

THE agricultural portion of Pontiac county is mainly confined to a belt of land fifteen to thirty miles wide lying between the Ottawa river on the south and the hilly Laurentian country to the north. The soils of this belt are very variable, ranging from sandy, through sandy-loam to heavy clay. Roughly speaking, these soils occur in strips parallel with the Ottawa and were evidently laid down by the river at the close of the Glacial Period when it was very much larger than it is at present and when it washed the foot of the Laurentian hills in the north. There are, moreover, evidences of stages of recession of this old and mighty river in the terraces running parallel with the river, which were for a time the old shore-lines or banks. Side-streams in later times, however, have cut through these terraces and produced the gullies which characterize certain portions of the district.

This variation in soils of Pontiac county has of necessity caused a variation in its agricultural activities. The excellent grazing and meadow lands bordering on the river have made stock-breeding and dairying profitable propositions, and have given the county a good reputation among breeders. The names of Horner, McDowell, Campbell, Cuthbertson, Wilson and Hodgins are known far beyond the limits of Pontiac county for their fine stock. The dairy industry is on a sound basis, and for many years has perhaps been the main source of revenue. More attention is paid to cheese-making than to butter-making, with the result that while it is easy to get a good quality of cheese it is just as easy to get a poor quality of butter. There is room for some enterprising buttermakers in Pontiac to make good money.

Cosy, substantial home of Mr. John Horner at Radford, Pontiac Co.

Co-operative Associations. Much progress has been made during the last two years in the establishment of co-operative societies of various kinds. The success of the Egg-Circles shows that there was a real need for such co-operation in marketing. The middleman exacted too heavy a toll for his services between the producer and the consumer. At the time of my visit the farmers were marketing their wool through the Pontiac Wool Association and were getting much better returns than usual. Much credit is due to Mr. J. K. King, the District Demonstrator, for his efforts in making these Associations successful. It is no easy matter to bring about co-operation among farmers as a rule, for they have been brought up in an atmosphere of independence and are reluctant to hand over powers to an executive. They fail to realize, however, that they have been doing this very thing in civic, church and political matters for generations.

Shawville, the chief business centre of lower Pontiac, is about forty-six miles from the city of Ottawa on a branch of the C.P.R. While not a large town it shows ear-marks of the enterprise and stability of much larger places. Of course it depends for its very existence on the surrounding farming community, largely composed of the descendants of good strong Irish and Scotch settlers who came over about seventy-five years ago. The Irish settled in Clarendon and the Scotch in Bristol. The stability of this community is well shown in the fact that, although there has been migration to some extent, the original farms are still mainly in the possession of the family descendants. Hodgins, McDowell, Horner, Wilson, Armstrong, Campbell, McFarlane and Grant are some of the old families, and their descendants are still numerous in lower Pontiac.

The French-speaking element is practically absent, as it was forty years ago.

Shawville possesses several good stores, two comfortable hotels, three flourishing churches, a high-grade academy, and satisfactory banking facilities.

---

preparing the honey for extracting. His product also will not bring quite so high a price per pound, but what he loses in that way he will make up for by a larger quantity, and so does not do so badly in the end. The same general remarks will apply to the extracted honey producer as to the comb-honey man. It will be necessary to have good sized colonies and to take off extracting supers previous to the time when buckwheat begins to yield in order to obtain the finest quality of honey. The principal care in producing extracted honey is to leave the supers on the hive until the honey is all capped over and has been well ripened by the bees. Well-ripened honey is thick, waxy, full flavored and of good aroma and weighs about twelve pounds to the gallon. Extracting combs built from full sheets of foundation, wired, can be extracted and given back to the bees to be filled again an indefinite number of times. Sometimes it happens in the fall that there are a few colonies that will need to be given a little honey in order to bring them safely through the winter, and it is a good thing to save a few combs of capped honey for this purpose.

HARRY W. JONES,

Bedford, Que.

Barns of Mr. Oswald Cuthbertson, Maple Ridge, Pontiac Co. Showing the silo, an essential for dairymen.

The public residences show good taste, and are both commodious and substantial.

The following table, based on the Census Reports of 1901 and 1911 may be of interest to many persons; it explains itself.

Place	Census of 1901.			h	French	Census of 1911				
	Total Popul.	Eng.	Irish	Scotc		Total Popul.	Eng.	Irish	Scotch	French
Pontiac County,	27522	1394	10452	2375	9397	29416	1475	9725	2100	14270
Clarendon Tp.,	2736	254	1974	423	61	2421	214	1722	415	33
Bristol Tp.,	2237	166	1199	668	165	1957	133	1027	601	149
Litchfield Tp.,	1814	90	1127	198	361	1382	20	933	100	305
Shawville,	648	99	390	132	14	715	55	534	95	16
Quyon,	682	83	339	48	201	806	100	377	66	245
Portage du Fort,	449	53	186	95	113	365	34	154	73	98
Bryson village,	508	21	189	86	209	477	21	131	69	244
Calumet Is.	1339	50	369	70	842	1208	67	325	36	776

Agricultural Societies.—Pontiac is a large county and has three agricultural societies. Society No. 1 represents the farming interests of the eastern district as far west as Waltham, with Shawville as its business centre. It is an active society, having, for president, W. Hodgins of Portage du Fort, and for secretary, R. W. Hodgins, both being real live wires. Every year the Society holds several important meetings, such at the Spring Stallion Show and the Fall Fair, and encourages in many other ways the best interests of the community. The other two agricultural societies of Pontiac are also doing good work, but I was unable in the short time at my disposal to visit the sections in which they operated.

It was stimulating to hear the pleasant things said about the excellence of the "Journal of Agriculture" by many farmers who are members of the Agricultural Society. The Journal is evidently appreciated in Pontiac.

Visits to Farms. Through the kindness of friends in Shawville and vicinity I was enabled to make calls at several farms in Clarendon and Bristol townships.

The long dry spell that ran through the entire month of May had not yet been broken at the time of my visit, and the crops on some of the farms showed plainly that rain was badly needed. The hay crop is likely to be short, and the grain crops not so heavy as usual. Some farms, however, were able to present splendid-looking crops in spite of the drouth, due to the fact that underlying the loam was a heavy bed of clay which conserves the moisture. We made a short stay at Mr. John Horner's near Radford, about three miles west of Shawville. Mr. Horner farms over 250 acres, and makes a special feature of breeding registered Percherons. He sends milk to the Clarendon Dairy Cheese factory. He also takes a keen interest in the rural telephones.

Mr. Jas. V. Findlay, another dairyman near Radford, has 250 acres, and keeps a large number of milch cows. Mr. Findlay is a director of the cheese factory and is interested in the development of rural telephones.

Mr. Thos. McDowell is a breeder of Clydesdales, Shorthorns, and Oxford Down sheep, and is vice-president of the Agricultural Society. He was honored in having his farm selected by the Conservation Commission as the local Demonstration farm.

To the east of Shawville, at Maple Ridge in Bristol township, we called on Mr. Oswald Cuthbertson for a few minutes, who takes an interest in cow-testing work. He is a breeder of Clydesdales, carries on a general dairy farm, and experiments to some extent in root fertilizers.

Mr. Duncan Campbell is a man who gives considerable time to general civic matters. He is interested in rural telephones, and is both a councillor and school commissioner. As a breeder Mr. Campbell devotes his attention to Clydesdales and Shorthorns.

Mr. John McNeill, Elmside, like Mr. Cuthbertson, is interested in cow-testing, and is active in matters pertaining to the Egg-Circle. He belongs to the Bristol Farmers' Club.

Mr. David Thompson on Clarendon Front is paying attention to Holsteins and hog-raising.

Mr. W. Hodgins, near Portage du Fort, is a farmer on an extensive scale, having more than 800 acres. His Clydesdales and Shorthorns are well known in Quebec and Ontario. He is mayor of Clarendon, president of the Agricultural Society and of the Telephone Co.

Mr. John McVeigh of Litchfield township, near Portage du Fort, is another farmer active in public affairs. He is a director of the Agricultural Society.

Women's Clubs. — That the women of lower Pontiac are active and eager to help along the movement for a better country life is shown by the number of Women's Clubs in full operation. Meetings have been held by Mrs. Muldrew, Miss Fisher and Miss Campbell and the women have well responded to the appeals, and clubs have been organized at Elmside, Bristol, Stark's Corners, Wyman, McCagg, and Shawville. Now that Miss Campbell can devote her entire time to the work it is confidently expected that the clubs will gradually become stronger and will show their influence and power in the community by an improvement in the social and economic life.

Barnyard of Mr. Thos. McDowell, near Shawville, Pontiac Co.

Rural Education. — The boys and girls of Pontiac are showing a great interest in poultry. Clubs have been formed through the agency of Mr. Jull and Mr. King, and prizes will be awarded at the end of the season to those who have obtained the best results.

It is by work such as this that boys and girls become interested in country life. As a result of the movement several boys and girls at the Shawville Academy intend going to Macdonald College next fall. Already Pontiac has sent several promising young men and women to the College, and the community speaks well of the results.

General .Observations. — Farming in Pontiac county is in a prosperous condition, and in the near future, through co-operation in many activities, the net returns will be still further increased. Until recently but little attention, for example, was given to the poultry and sheep industries. Through co-operation however it has already been shown that there is money in eggs and poultry when properly handled. Lately, through the formation of a Wool Association, the farmers were enabled to get a larger return than usual for their unwashed wool. The success will likely have the effect of drawing the attention of the farmers to the value of the sheep industry. There is indication of a revival of the sheep industry in Pontiac.

But little attention, however, has been given to the matter of underdrainage of farm lands. Some demonstrations at Mr. McDowell's and other places prove conclusively the value of underdrainage. The time is ripe, therefore, for a vigorous campaign in this direction. Mr. King informs us that he is going to do all he can to help along the movement by making surveys. Judging from his success in other ventures we believe he will make this "go" also.

Shawville is the record centre of the district Cow-Testing Association. Mr. R. W. Hodgins is recorder and is doing his utmost to induce dairymen to begin the work of testing their herds. A large number of dairymen have joined the Association, so that this work is also helping along the movement for better farming.

When the C.N.R., which runs between the C.P.R. and the Ottawa river, is completed, the southern part of Pontiac county will be well provided with railway facilities. The farmers will then have excellent market connection with the cities of Ottawa and Hull.

Losses by Fire.—Two villages in Pontiac suffered very severely during the late dry spell. Large portions of Portage du Fort and Bryson were destroyed by fire, involving great loss not only to the owners but to the farming communities depending upon these villages for supplies.

In addition to these, considerable loss to farmers was occasioned by the outbreak of forest fires which spread with great rapidity on account of high winds. The rural telephone was of great service in bringing help quickly to threatened quarters, and was the means of saving much valuable property.

Summing up: — while there are a few localities in Quebec where farming is carried on more scientifically, the practice of Agriculture in Pontiac is maintained at a high level. The people are contented, even optimistic.

There is every reason to believe that fine things are in store for the farmers when they have made the improvements noted in this article.

W. L.

Large stock barns of Mr. W. Hodgins near Portage du Fort, Pontiac Co. He too has his silo.

THE BACK-TO-THE-LAND MOVEMENT

From a Farmer's Standpoint

Editor, Journal of Agriculture,—

TO the city man who contemplates farming and who plans a return to the land, I would say, count well the price before taking the leap. Have you a correct idea of the cost of producing crops, milk, eggs or meat? One gentleman, whose source of income is in the city but who has a farm as well, recently remarked that he knew there was money in farming because he had put a number of thousands into it. In regard to the cost of producing milk, consider the following figures. The Massachusetts experiment station at Amherst after six years study of their herd of grade Jerseys giving more than 6,000 lbs. of milk each, per year, (which is about double the production of the average cow) has concluded that it costs practically 5½ cts. per quart to produce milk in Massachusetts.

The supervisor of farms owned by the Borden Condensed Milk Co., in the United States, makes this remarkable confession. "The exploitation of the several farms by the Bordens has also taught an invaluable object lesson to the corporation; because the company had itself always insisted, when discussing the subject, that at the price their factories pay the farmer for milk there is a big profit in dairy farming. But to their great surprise, in practice, they found incontestable facts that even with silage and other home-grown roughage they actually produced milk on their own farms at a considerable loss when obliged to sell it to their own plants or factories at the same price as the farmer receives." Quoting from a recent issue of the Farmer's Advocate: "According to figures from different competent men in Alberta it costs the prairie farmer 26 cents per bushel to produce oats, and 61 cents per bushel for wheat. In arriving at these figures interest on investment and a living wage for the farmer, his wife and family were considered as they should be, and keeping in mind the fact that in some years a large quantity of the wheat is damaged by frost or snow, when the grain grower actually receives less for his crop than these prices, it would not seem that he was too well paid." Interest on investment and wages for the farmer and his family are generally overlooked by farmers themselves when estimating their incomes. Many a man, if he took these items into consideration, would find that he would have more to live upon if he would sell his farm, invest the money at 5% and hire out to the buyer.

The would-be farmer of the city, as a rule, has a very limited idea of the amount of knowledge and skill required to carry on a farm successfully. If he operates a small holding and grows special crops he must remember that special crops require special knowledge and experience. If he goes into general farming he must have an understanding of soils and drainage, of tillage, conservation of moisture, fertilization, curing of crops, insect pests and plant diseases. He must understand the feeding and care of animals, and be more or less of a veterinarian. The kind and condition of soil required for various crops, amounts of seed to sow, depth of sowing, etc., are matters of intuition to the experienced tiller of the soil, but must be acquired by the beginner. The experienced farmer understands something of the construction of buildings, and the use of carpenter's, blacksmith's and mason's tools, and must have a fairly good knowledge of farm machinery. There is skill in the use of such common tools as the axe, scythe, fork and shovel. Watch a novice plowing, pitching hay or digging a ditch and this fact will be demonstrated. All of these things are unconsciously acquired by the farm boy, but must be learned by actual experience by those less favoured in their childhood. As Dr. L. H. Bailey of Cornell ably puts it, "the man must know the business—really know it. If he doesn't know it, and know it as a practical farmer, he must learn it by actually going onto a farm and working out for a time. You can't dream, farming, and you can't get it out of books."

Success in any business means hard work, and especially is this true of farming. During busy seasons and when the weather is right for seeding, haying or harvesting, most farmers work from twelve to sixteen hours per day. But don't let the would-be farmer get the idea that there is nothing to do during the winter or on rainy days. To be sure, a man may rest up occasionally with no special loss, but the busy farmer is always able to find work for rainy days, and if he has stock to look after the winter is by no means an idle time. Modern machinery certainly makes farm work less laborious and disagreeable; but the biting cold of winter, the chilly winds of spring and fall, the fierce heat of the summer sun, the blinding dust of the cultivated fields and the mud and ooze of the ditch are facts which must be faced. Losses must be looked for, for they are certain to come. Unfavourable weather, frost, insect pests or plant diseases may injure or destroy the crops you have spent so much time, labour and thought upon. Horses or cattle may die of indigestion or other ailments, and contagious diseases may carry off your pigs or chickens. Don't imagine that these things seldom happen: fortunate is the farmer who does not experience at least some of these losses every year of his life.

Happily there is another and brighter side to this great question. The upward tendency of prices of farm produce must continue. In the past history of this continent vast tracts of fertile virgin soil were constantly being added to the cultivated area, bringing more land under tillage than was needed for the existing population. The end of this soil mining is in sight. The best land in our "last great west" is already occupied, if not farmed. To be sure there are still large unproductive areas on this continent which can be brought under cultivation; but this will require a vast outlay of capital, and capital will not flow in that direction until prices insure remunerative returns on the investment. Money is an end which every worker seeks; but to the man who loves his work, takes "joy in the job," as the editor of the Rural New-Yorker puts it, money is only a necessary part of his remuneration. And this thought I would like to impress upon the would-be farmer: Be sure that you are going to "take joy in your job," before you leave the city. If you can watch with pleasure the shimmering light of the sunrise, as the great golden ball breaks over the mountain top; if the calm glow of a summer evening speaks to you of peace and contentment; if the singing of birds and the "sound of many waters" is sweet music to your ears; if the animals are your friends, and the growing crops and waving fields of grain a delight to the eye; if you can share in the divine satisfaction of actually producing something, which is far sweeter than simply acquiring wealth through the manipulation (too often dishonest manipulation) of what others have produced; if you are able after reclaiming or permanently improving a piece of land, to feel the satisfaction that you have worked for the betterment of all future generations; if all of these things can still be remembered and bring you joy, even when the muscles ache from weariness and the beads of sweat stand upon your forehead; then you may consider yourself as fit for the inheritance, and the words of the sweet singer of Israel may be your benediction: "Put thy trust in the Lord and be doing good; dwell in the land and verily thou shalt be fed."

C. S. MOORE,

Missisquoi Co.

MEGANTIC COUNTY FARMERS AT MACDONALD COLLEGE

A Successful Excursion and Fine Weather

FINE weather favored the Excursionists from Megantic county on Wednesday, June 17th, to Macdonald College. Fully 120 responded to the "roll-call" of Rev. H. A. Dickson of Rectory Hill, President of the Horticultural Society, under whose auspices the excursion was organized. The large number present is evidence that Megantic is eager to learn the latest information regarding farming, for it was no mere holiday to drive ten or twenty miles to the railway, and then to spend over eight hours in a railway coach before reaching Ste. Anne de Bellevue about 8.30 a. m.

Rev. Father Voyer of St. Pierre Baptiste and Rev. Father Dupont of Inverness accompanied a large delegation of French-speaking farmers who appeared to be much interested in the crops and stock of the College farm.

On the arrival of the excursionists they were conducted to the large Assembly Hall where Principal Harrison and several members of the staff welcomed them and outlined the itinerary of the day.

In the shade of one of the College buildings the whole party assembled for a lunch of sandwiches, cheese and coffee. Short speeches were given by Rev. Mr. Dickson and Father Voyer, expressing their thanks to Principal Harrison for the kindness shown them.

The excursion party contained a fair percentage of women who visited the gardens and orchards along with the men, and spent a most enjoyable time under the guidance of Miss Campbell, the Demonstrator for the Homemakers Clubs, observing a cooking demonstration by Miss Hill on "Cooking for the Sick", and inspecting the dairy and poultry departments.

The Megantic County Excursionists enjoying lunch in the shade at Macdonald College.

The men of the party after the morning's inspection of the garden and orchard visited the Cereal Plots, the Poultry plant and the stables.

Among those present were observed:

S. W. Mooney, President, Megantic Agricultural Society, A;

J. B. Campbell, Secretary, Megantic Agricultural Society, A;

William Dinning, County Councillor and Mayor of Ireland South;

W. J. Jamieson, Secretary, Leeds Farmers Club;

Thomas R. Porter, Secretary of South Ireland Municipal Council;

Weston Graham, Secretary of the Horticultural Society.

At the present time Megantic is without the services of a Macdonald Demonstrator. Compton, Missisquoi, Sherbrooke, Richmond, Pontiac and Huntingdon have fulfilled the conditions asked by the College and each has a demonstrator who gives all his time for the benefit of the farmers. The conditions are:—the county shall agree to give $100.00 the first year, $200.00 the second year and $300.00 the third year. There is a strong feeling in Megantic county that the county council made a mistake when it refused recently to make the necessary grant for a Demonstrator. It is believed, however, that before another year is past Megantic will have its Demonstrator.

LIFTING WATER FROM BROOK TO KITCHEN

Editor, Journal of Agriculture:—

I have a brook 400 ft. from the house. The elevation from the brook to the kitchen floor is 28 ft. Could I put a pump in the kitchen and lift the water? What kind of pump would be best, and what size pipe should I use?

K. Y. P. Que.

Ans. You could place a pump in the kitchen and lift the water as follows: Buy a good iron cistern pump and place it near the kitchen sink. Have the cylinder in the cellar connected to the pump by means of a 2'' pipe. Use 1½'' galvanized iron pump from the cylinder to the brook. Put this at a depth of 4½ ft. underground. Put a good strainer on the end of the pipe in the brook. Attach this strainer by means of an elbow so that the open end of the strainer points down stream. This will prevent the strainer from becoming clogged. Near the brook, but above high water mark, put a swing check valve on the suction pipe. Use a swing check valve with leather seat and one that can be opened for examination. Leave a dry well above this valve so that you can get at it. If the cylinder is 5 ft. below the kitchen floor the elevation from the brook to the cylinder would be 23 ft. The cylinder will lift the water this distance with ease. This outfit will give you satisfaction.

C. J. LYNDE,

Macdonald College

POWER FOR GRINDING

Editor, Journal of Agriculture:—

I have a grinder which grinds about 20 bushels per hour. How much power should I use? Could I use the same power for pumping?

J. T. Que.

Ans. We advise you to use a 5 h. p. engine. This will do the grinding handily. You can use less power but you would need to feed the grain somewhat slower. You can pump water with any power from 1 h. p. up. You can pump water and grind grain at the same time with a 5 h. p. engine.

C. J. LYNDE.

The Farmers' Excursion from Megantic County to Macdonald College. Grouped after lunch.

SUPPLYING WATER FROM SPRING

Editor, Journal of Agriculture:—

I have a spring which flows summer and winter at the rate of 4 gallons per minute. I can get a fall of 15 ft. in a distance of 30 ft. and I can get more fall if needed. I wish sufficient water to supply dwelling house and 12 head of cattle. The distance from the house to the spring is about 1000 feet. The elevation is 130 ft.

(1) Can I lift the water by means of a hydraulic ram?
(2) If so, what size ram?
(3) What length of drive pipe and what fall?
(4) How many gallons will it pump per day?
(5) What would the whole outfit cost?

S. S. Que.

Ans. You can lift the water by means of a hydraulic ram, but the quantity of water you have is rather small. We assume, however, that you have stated the maximum amount. Use a No. 4 ram. Use a drive pipe 150 ft. long, with a fall of 20 ft. Use 1½ ''galvanized iron pipe for drive pipe. This outfit will deliver at your house about 350 gals. per day. Use 1'' pipe from the ram to the elevated tank. Use ¾'' pipe to distribute the water from the tank. The No. 4 ram with 150 ft. of drive pipe and 1000 ft. of 1'' delivery pipe will cost you about $100.00.

There are rams of an improved type on the market. One of these with 30 ft. of fall would deliver about 650 gals. per day to your elevated tank. This outfit, however, would cost you about $150.00. We believe 350 gals. will cover your requirements but we advise you to put in a tank of about 700 to 1000 gals. capacity so that you can use water faster at times if you wish.

C. J. LYNDE

ILLUSTRATION FARM SELECTED, OWNED AND WORKED BY MR. THOMAS McDOWELL OF SHAWVILLE, P. Q.

THIS farm is quite close to the village of Shawville and has several advantages for carrying on Illustration work. Mr. McDowell has one of the best herds of Short-horn cattle in the province also Clydesdale horses. Having good horses and cattle, it gives the visitors a splendid opportunity of inspecting and getting information on the care and management of live stock, as well as on growing farm crops.

The Illustration work that is being conducted on this farm is with pure seed grain to be sown and compared with the ordinary grown. It is also intended to sow an extra quantity of timothy and clover seed to demonstrate that it pays to seed much heavier than the quantities usually used by our farmers.

Apart from the Illustration farm work, Mr. McDowell is interested in the production of pure seed Timothy and Common Red Clover; Alsike and Alfalfa are being grown with the object of saving seed next season, and also in running a four year rotation on a protion of his farm. A 20-acre field, adjoining a well-travelled road, was selected and it is divided into four equal parts. The whole of this field being a two year old meadow affords a splendid opportunity of showing the farmers the advantage of a rotation of crops, the application of manures, discing and using extra seed on meadows, top dressing meadows, pure seed vs. common seed, heavy seeding of grasses and clovers, two crops of hay instead of one for the same year.

LIVE STOCK

THE BACON INDUSTRY IN THE PROVINCE OF QUEBEC,

Work done for its Improvement, by A. Hansen, Expert of the Department of Agriculture of Quebec

ABOUT a year and a half ago the Department of Agriculture of the Province of Quebec engaged me to take charge of the bacon industry. I came from Denmark where I had been for many years manager of the oldest co-operative slaughter-house.

On my arrival in Canada I was ordered to make a report on the hogs of the province, as to their suitability for use in the bacon industry. On the whole I found them well suited for the production of bacon, but in many instances the breeding and feeding methods required to be improved.

My next work was to give lectures on the breeding, feeding, etc., of hogs, to the pupils of the Agricultural School of La Trappe, and when this course was completed an old building was put in repair for the making of bacon. Some of the pupils were helpers in the practical work and the first killing took place about Christmas, 1912.

Last summer a new house, with rooms for ice, cooling, curing, and killing, was built, and the production of bacon continues with weekly killings. Some of the bacon is used at home and the remainder is sold.

After finishing my first work at La Trappe I went for a short time to Macdonald College, in order to give lectures on the breeding and feeding of pigs, etc. On the completion of my work there I went to the Agricultural School of Ste. Anne de la Pocatière where I did much the same work that I did at La Trappe. There also the pupils were given the necessary help in the practical work.

Mr. Garneau, a graduate of last year, is now the instructor in the practical bacon industry at Ste. Anne de la Pocatière, and he also takes care of the piggery.

A good part of the bacon that is made there is used in the large classical college, and the remainder is sold. There are regular weekly killings. Hitherto only pigs from the stables of the college have been killed, but in the future pigs reared by the neighboring farmers will be utilized.

At St. Valier, north of the city of Quebec, the Department of Agriculture has bought a place where a small slaughter-house will be built for producing bacon, etc., in order to show the farmers the right way of doing the work so as to get the highest possible prices for their produce.

Macdonald College will also probably in the near future take up practical work in the production of bacon, etc.

Advice, lectures and several plans for new piggeries have been given to many farmers interested in the new industry.

My lectures have been written up and will soon be printed.

Very little attention has been given to the matter of exportation of bacon, partly because small slaughter-houses are not in a position as yet to produce bacon regularly, and also because the production of pigs in the province of Quebec does not even meet the demands of the home market.

Five acres in 1913 were in hoed crops, one acre in roots, and four acres in corn. Two varieties of corn were grown on this plot, "Longfellow", a flint corn which gives a heavy yield, and is almost certain to mature in this district; "Leaming", a dent variety, which is later in maturing but gives a much heavier yield per acre. The object of trying the two varieties of corn on this field was to get the heaviest yield and of a sort that would mature in the best state for ensilage purposes.

The adjoining five acres was also a two year old meadow. Immediately after the hay was harvested in 1912, this field was ploughed very shallow, rolled, harrowed and cultivated at intervals to keep down all growth until autumn. It was then thoroughly ploughed and left to stand over winter. This five acres was sown with pure seed oats at the rate of 2½ bushels per acre, and in addition was seeded down with timothy 8 lbs., common red clover 8 lbs., alsike clover 2 lbs., making 18 lbs. of timothy and clover seed per acre.

The adjoining five acres was also a two year old meadow. Half of this was left in its meadow condition and a crop of hay was harvested the season of 1913; the remaining half was top-dressed with the lightest coating possible of barnyard manure.

The adjoining five acres was also a two year old meadow. All of this five acres was disk-harrowed twice, and an additional 6 lbs. of timothy seed sown per acre. The seed was covered by harrowing twice with the smoothing harrow. Half of this five acres, in addition to the seed, was top dressed with barnyard manure similar to the adjoining five acres.

In planning this experiment the object is to show the farmers that by disc-harrowing their old meadows and sowing new seed, the meadow will thicken up and will be greatly improved the following year; also the application of manure on half of the new seeding and the application of manure on half of the old seeding will show the farmers of the district that this is one of the best ways to apply the barnyard manure and to increase the yields of their meadows.

As this is a four year rotation, it will be noted that field number one in 1913 was in Corn and Roots and is seeded with Grain and Timothy and clover in 1914.

Field number two, which was seeded in 1913 with Grain and timothy and clover will be in hay in 1914. It is proposed to take two crops of hay off this field in the one year, the first crop being harvested early, and to allow the second crop to mature for seed. This experiment should show the farmers where a great advantage can be gained by crop rotation and heavy seeding of grasses and clovers.

Field number three which in 1913 was in meadow will be in corn in 1914. The part that was top dressed on the meadow in 1913 should give a larger yield of hay and, when this sod and manure are turned under the following year, should give an increased yield of corn over that part which received no top dressing.

Field number 4 which in 1912 was disk-harrowed and had fresh seed sown gave a heavy crop of hay in 1913. There was also a distinct difference on this plot where the barnyard manure was applied. This field in 1914 is again in hay; this being the fourth year for hay, the new seeding and top dressing should help this field very much.

If farmers would adopt a systematic rotation of crops, it would equalize the work, improve the mechanical condition of the soil, destroy weeds and insects, and increased crops would be sure to follow.

J. FIXTER,

of the Conservation Commission

Illustration Farm of Thomas McDowells near Shawville, Pontiac Co. Photo shows the corn area in the 4-year rotation. The public road is to the left of the picture.

THE 1914 WOOL CLIP

Proper Grading Necessary in Marketing, Tub Washing should be Discouraged

MOST of this year's wool has already gone to market and farmers generally have been congratulating themselves on the advance in prices received. The price of wool has been steadily increasing since the season opened and buyers have bought greedily whenever opportunity offered, the result being a firming up of prices. A general survey of conditions, however, show that farmers here have received a lower price for their wool than our neighbors to the south and considerably lower returns than most of the other colonies.

When we consider that our conditions are such as tend to the production of first-class wool the question arises. "Why are we not getting as high a price as our contemporaries ?" Various reasons might be suggested. In the first place there is no organized effort on the part of the farmers to market their wool co-operatively. The present system of allowing local dealers to handle the wool is not to be commended. These men handle the wool merely on a profit basis and in most cases the quantity bought does not warrant the proper facilities and outlay necessary to put this product on the market in a suitable condition. Moreover, in almost every country town there are two, three and even more men who buy wool, the result being that the wool from one section is divided into several lots and that from a county into a

The Piggery at Macdonald College.

hundred or more. So far these local dealers have made no effort to educate themselves in regard to the respective value of wool grades and qualities. Not infrequently clerks in local stores, grain merchants or dealers take on this wool, practically all of it being bought at a flat rate regardless of quality. It is stored in any convenient place around a store mill and elevator or shed until such time as it is ready for shipment, during which time it often accumulates dirt or is subjected to dampness and other conditions unfavorable to wool fibres. Dirty wools are mixed with clean ones, coarse wools with fine, short wools with long. Few mills consider these small lots of wool worth bothering with for the following reason: 1st, they are not sure of any particular grade; 2nd, much of the wool may be spoilt; 3rd, in order to secure sufficient of any one grade for a special line of goods they have to buy thousands of pounds of wool of other grades which they do not need. A number of mills do buy quantities of this wool but at a price low enough to cover all expense of grading and sorting, etc., even with the poorest consignments. Canadian wool lends itself as freely to grading and classification as wool from any other country, yet owing to the fact that in Canada we have as yet no recognized grades of canadian wool, few of our mills manufacturing high class goods handle Canadian wool at all owing to present conditions of handling. Until such time as there is established some system whereby Canadian wool will be properly graded and manufacturers are certain that they can buy in large quantities according to grade, they will continue to buy foreign wool at advanced prices. Canadian wool lends itself as freely to grading and classification as wool from any other country.

Tub washing as practised in many parts of Quebec is to be discouraged. This work is often done in a tub in warm weather, others boil the wool in a boiler on the stove, some wash it in a creek or river. Of these methods creek or river washing is perhaps the best as in this case there is a larger volume of water and more chance for the dirt to be carried away with less labor. Boiling is often injurious as heat affects the wool fibres. As soon as washed the wool is spread out on the grass or fences to dry, and it is here that a great deal of the damage is done. Wool when spread out on the grass or fence is exposed to the wind and the movement of the wool in this way often causes matting which destroys the fitting qualities for manufacture. Tub washing is not to be commended in any case because the fleece is torn apart, the finer portions are mixed with the coarser, seedy or matted fleeces are mixed with those that are cleaner and of better quality and the wool from the town breeds is mixed with that from the long wooled breeds. Tub washing eliminates all possibility of grading except in a very crude way, and this wool cannot be used for the manufacture of the finer goods because there is no means whereby fibres of even length, strength and quality can be sorted out. Much of the fine wool that could otherwise be used for the manufacture of finer articles has to go in with the coarser class, hence the whole tendency with tub washing is to bring down the grade of our wool and force the manufacture of a lower class of goods.

Again tub washing does not remove all the dirt from wool. Average domestic wool contains about thirty five to forty per cent of wool yolk and wool fat as well as sand, chaff and other dirt. Tub washing, if well done, will remove about thirty per cent of these materials. Much of the chaff and seeds still remain and the wool has to go through the picker, some of it has to be rescoured and matted portions need special attention, so that the preparation of tub-washed wool for manufacture is almost as costly and in some cases more so than if it were left in the grease.

There is at the present time sale for a limited quantity of tub-washed wool which is used for the manufacture of yarns and coarse felt goods. Most mills, however, have up-to-date machinery installed for the scouring process and are in a position to do this work in the proper manner and cheaper than the average farmer can afford to do it. All modern mills employ the services of one or more sorters, and where this is the case the lower sorts of wool are used for low grade articles, and the better sorts and more valuable sorts go into the better class of goods, so that unwashed wool is better value to the manufacturer and realizes more money to the farmer with less labor. An educational campaign and an organized effeort in marketing is all that is necessary to put the wool trade on a new basis.

A. A. MACMILLAN

Macdonald College

THE QUEEN OF THE DAIRY WORLD

May Rilma, Guernsey, Champion Cow of the world

THE Guernsey cow, May Rilma, owned at the famous Chesterbrook Farm, the home of the late A. J. Cassatt, now owned by his son, Capt. E. B. Cassatt, Pennsylvania, has given in three hundred and sixty-five days, 19639.50 lbs. milk which contains 1059.59 lbs. butterfat. This cow was bred and raised at the farm and her year's work has been carefully supervised under the regulations for the Advanced Register of Guernsey cattle conducted by the American Guernsey Cattle Club. While officially supervised by the representatives of the Pennsylvania Agricultural Experiment Station, her work has also been checked by six similar institutions in other states and by a representative of the Dairy Division of the United States Department of Agriculture.

This record surpasses that of any cow of all the dairy breeds in the world. May Rilma is producing more butterfat in her thirteenth month than in her first, thus widening the distance beyond her nearest competitor and more firmly establishing herself as Queen of the Dairy World.

American Guernsey Cattle Club

The following information concerning the breeding of May Rilma, the system of feeding and caring for her during her record breaking period, was sent to us by the manager of Chesterbrook Farm, Mr. R. A. Colgan:

May Rilma 22761. Dropped Dec. 15, 1906.

Sire Mars of Woodcrest 9290.

Dam Rilma of Paxtang 10331, by Sheet Anchor II, 4149.

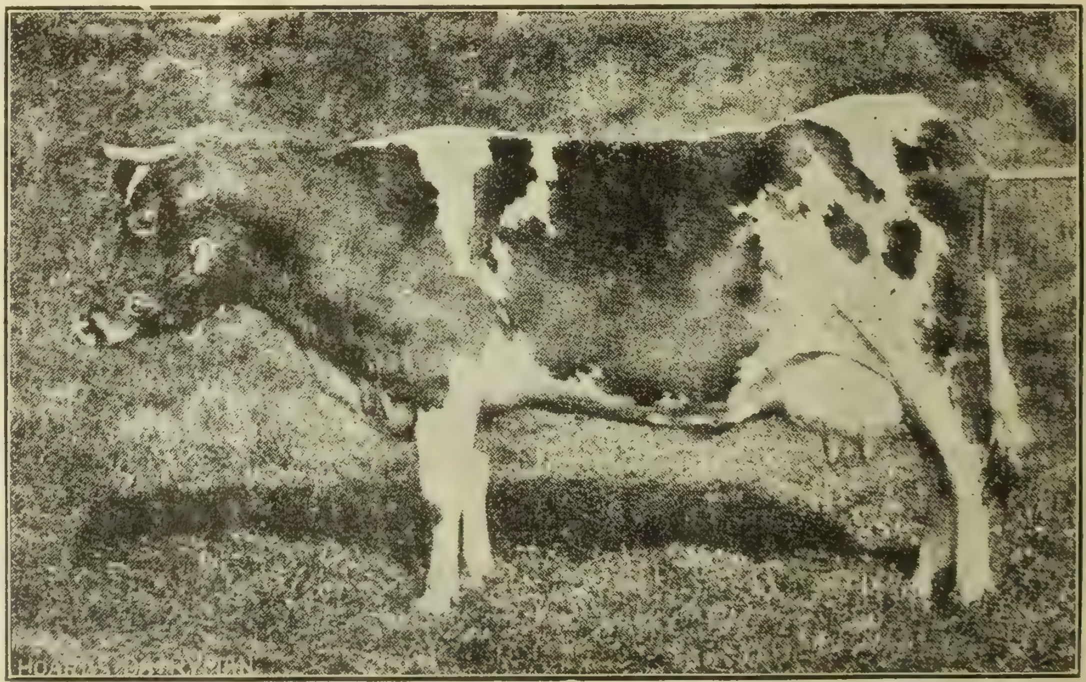
2nd dam Princess Bonnie of of Paxtang 8777, by Razzle Dazzle of Springside 2329.

3rd dam Caprice of Paxtang 8775, by Garfield, Jr., 1498.

4th dam Guernsey Queen of Paxtang 1570.

May Rilma is kept in a box stall, is milked three times a day, viz., 4 a. m., 12 noon, and 8 p. m. She is fed 18 lbs. daily of the following mixture: 250 lbs. bran, 100 lbs. gluten, 50 lbs. cottonseed meal, 50 lbs. oil meal, 50 lbs. hominy; also 3 lbs. beet pulp and 3 lbs. molasses; alfalfa hay, clover hay, and ensilage at liberty. We started to feed her 16 lbs. carrots daily on January 24th.

Of late, world's records have been coming thick, and fast, and large. In 1905, Yeksa Sunbeam, a Guernsey, owned by the late Fred Rietbrock, astonished the dairy folk by producing in 365 days, 857.15 lbs. of fat. She was given the title of champion dairy cow of the world and held this rank till 1907, when Colantha 4th's Johanna, a Holstein, owned by W. J. Gillett, produced in 365 days 998.26 lbs. of fat. It seemed to those who know



MAY RILMA, A GUERNSEY, CHAMPION COW OF THE WORLD.—Record:—19,639.50 lbs. milk containing 1,059.59 lbs. fat. Owned by Capt. E. B. Cassatt, Pennsylvania.

and comprehend what records of this character mean that no cow would ever be able to excel it. But in 1911 came Pontiac Clothilde DeKol 2nd, a Holstein, owned by Stevens Bros., with a record for 365 days of 1017.3 lbs. fat, and following close on her heels in 1912 came Banostine Belle DeKol, a Holstein, owned by Dimmick Bros., with a record for 365 days of 1058.34 lbs. of fat.

There has been a pause for nearly two years in making world's records, for exceeding these records is a Herculean task and like lowering the speed record of the famous pacer, Dan Patch.

However, no record is beyond excelling, and here comes the Guernsey matron, May Rilma, and claims the honor of being the new world's champion cow. Praises to her owner, breeder, caretaker, and her blood.—HOARD'S DAIRYMAN.

THE ORMSTOWN SPRING SHOW

The Live Stock Breeders' Association of the District of Beauharnois hold a very successful Show, June 3-5. Exhibits in Advance of Previous Years.

THE Ormstown Spring Show has won its spurs as one of the best live-stock shows in Canada. The Show held June 3rd-5th was the fifth of the kind, and, in spite of the unsettled weather, was a decided success.

The Ayrshires were out in such numbers that seldom or never has a better display of this breed been seen in Canada. Altogether they numbered 228 and classes of 15 and 20 were common. The Beauharnois district has long been famous for its fine Ayrshires and Clydesdales. There is, perhaps, located about Howick, Ormstown and Huntingdon, a larger number of breeders than there is to be found in any similar area in America. The names of Ness, Logan, Pringle, McMillan and Leggat, Gordon, Cavers, McArthur and McKell are known far and wide for their association with the best Ayrshires, while McEachran, Nussey, Cavers, Ness, Pringle, McCormick, Wagg, and Greig are noted for fine Clydesdales.

The display of Holsteins was not so great as that of Ayrshires, and not so large as last year's, but there were some animals of very fine quality shown by Sangster, Alexander, McCrae, Lalley and Younie.

F. E. Arnold of Grenville showed a few Percheron stallions, of which a young stallion was much admired and Dr. McEachran exhibited some good speciments of shires.

A feature of the Ormstown Show that never fails to attract and please the crowd is the evening performance. All the world loves a good horse and, to a still greater degree, loves to see a good horse perform. The horse figured prominently in every evening performance. Hurdle jumping and driving pleased the people in the galleries much better than the vaudeville stunts usually relied on to attract attendance to fairs in small places. A feature that would appeal particularly to dairymen was the nightly parade of all the dairy cattle on the grounds. What could please a lover of the dairy cow more than an arena full of good ones, led out by white-clothed attendants!

Judges. The judges were:—Heavy horses—H. Barber, Gatineau Point; G. W. Muir, Youville, and A. Bell, Trout River.

Ayrshires—D. Drummond, Ottawa;

Holsteins—Professor Barton, Macdonald College;

Sheep and Swine—Claude Bain, Taunton, Ont.

Judging Competitions.—One of the most interesting features of the show was the judging competition between teams of three young men, representing different counties, for the Barton Trophy and the MacDougall prize money of $50.00. Four counties were represented, viz., Pontiac, Argenteuil, Chateauguay and Huntingdon. Messrs. Horner, Duff and Eades represented Pontiac; Messrs. G. C. Hay, J. D. Hay and Todd, Argenteuil; Elliott, J. E. Ness, and McEwan, Chateauguay; and Biggar, Hyde and Crutchfield, Huntingdon.

The Argenteuil team won first place and the Barton trophy. Pontiac came second, only one point behind Argenteuil. Chateauguay came third and Huntingdon fourth. Geo. C. Hay of Lachute won the prize for taking the greatest number of points in judging. The competition included the judging of swine, sheep, dairy cattle and horses. The trophy is to be won three years before it becomes the permanent property of the county.

The officers under whose direction the show was held were: — Honorary president, Dr. McEachran; president, Neil Sangster; first vice-president, George E. Baird; second vice-president, W. F. Stephen; D. J. Greig and R. R. Ness; secretary-treasurer, J. G. Bryson, and they are to be congratulated on the excellence not only of the prize list, but also on the excellent facilities existing for the handling of stock on the grounds.

THE WINNERS

The following are the prize winners at the annual live stock show at Ormstown, Que.

GRADE BROOD MARES

Mare with foal at foot or to foal not later than Aug. 1, 1914, 1,350 lbs., and under—1, Robt. Kerr; 2, Geo. White; 3, P. Dickson; 4, W. Kerr and Son; 5, McNaughton Bros.

Mares, 3 years old—1, W. Cullen; 2, Jno. Walker; 3, J. D. McEwen; 4, J. Cavers.

Gelding, 3 years old—1, W. J. McGerrigle; 2, Walter Scott; 3, Geo. Hooker.

Fillies, 2 years old—1, D. McCormick; 2, Jos. Hadley; 3, D. McCormick.

Filly or colt—1, P. Dickson; 2, J. H. Nussey; 3, Norman McClenaghan; 4, R. McCurdy.

TEAMS

Imported registered Clydesdale mares—1, R. Ness & Son; 2, Dr. McEachran; 3, J. C. Steele; 4, R. Ness & Son.

Canadian-bred registered Clydesdale mares—1, Geo. White; 2, W. Nussey; 3, R. W. Whiteford; 4, A. Nussey.

Grade draft team, 2,700 pounds and over—1, W Pringle; 2 and 3, D. J. Greig; 4, E. Bazinet.

Grade draft team under 2,700 lbs.—1, W. Cullen; 2, Jas. Bryson; 3, D. McCormick; 4, W. Kerr & Son.

One of Dr. McEachran's specials—Best Canadian-bred registered stallion, G. H. Montgomery.

Wm. Cullen's special—Best farmer's team—1, Jas. Bryson; 2, D. McCormick.

S. McGerrigle's special—Best draft gelding, 3 years and under, J. H. Nussey.

R. J. McDougall's special—Best draft filly, D. McCormick.

Dr. McCormick's specials — Best draft mare (grade), D. McCormick; best light draft mare (grade), W. Pringle.

AYRSHIRES

Bull 3 years or over—1, R. R. Ness, Howick; 2, Geo. Montgomery, Philipsburg; 3, J. W. Logan, Howick; 4, Sir Montague Allan, Beaconsfield.

Bull 2 years old—1, J. H. Black, Lachute; 2, R. S. Pringle; 3, McMillan and Leggatt, Trout River; 4, D. Thompson.

Bull, 1 year old—1, Hector Gordon, Howick; 2, W. F. Kay, Philipsburg; 3, R. R. Ness.

Junior Yearling Bull—1, J. H. Black; 2, P. D. McArthur, Howick; 3, J. W. Logan.

Senior calf—1, R. R. Ness; 2, W. F. Kay; 3, Jas. McKell, Riverfield; 4, H. Gordon.

Junior calf—1, R. R. Ness; 2, P. D. McArthur; 3, D. T. Ness; 4, W. F. Kay.

Mature cowe in milk—1, H. Gordon; 2, G. Montgomery; 3, J. W. Logan; 4, W. F. Kay; 5, R. R. Ness.

Cows,3 years old, in milk—1, W. F. Kay; 2, Sir M. Allan; 3, J. P. Cavers, Ormstown; 4, McMillan and Leggatt; 5, H. Gordon.

HEAVY HORSES

Registered imported Clydesdale stallions and mares:—

Stallion, 4 years and over—1, R. Ness and Son, Howick; 2, John McGerrigle; 3 and 4, Dr. McEachran, Ormstown.

Stallion, 3 years—1, R. Ness and Son.

Stallion, 1 year—1, Dr. McEachran; 2, D. Cavers, Ormstown.

Clydesdale brood mares, imported, with foal at foot or to foal not later than Aug. 1st, 1914—1 and 2, Dr. McEachran; 3. J. C. Steele.

Yeld mares, 4 years and upwards—1, Dr. McEachran; 2, R. Ness and Son; 3, S. McGerrigle; 4, J. C. Steele.

Mares, 3 years old—1, R. Ness and Son; 2, Dr. McEachran; 3 and 4, Nelson Wagg.

Mares, 2 years—1, Dr. McEachran.

Canadian bred registered Clydesdale stallion:—

Four years and over—1, Wm. Nussey; 2, R. W. Whiteford.

Three years old—1, McDougall Bros.; 2, Francois Beaulieu.

Two years old—1, G. H. Montgomery, Philipsburg; 2, A. G. Steele; 3, Taylor Bros.

Registered brood mares with foal at foot or to foal not later than Aug. 1, 1914—1, Robert Todd; 2, R. W. Whiteford; 3, W. Nussey; 4, G. E. White; 5, D. E. McCormick.

Yeld mares, 4 years old—1, Geo. White; 2, D. Glenn; 3, Jno. Cavers; 4, W. T. Rice.

Mares, 3 years old—1, Dr. McEachran; 2, Dav. Pringle; 3, Jno. Brodie, Montreal; 4, R. W. Whiteford.

Mares, 2 years old—1, D. Pringle; 2, S. McGerrigle; 3, R. W. Whiteford; 4, McDougall Bros.

Mares, 1 year old—1, McEwen Bros.; 2 and 3, R. Ness and Son.

Grade brood mares, heavy, with foal at foot or to foal not later than Aug. 1, 1914, over 1,350 lbs. —1, J. H. Nussey; 2, Geo. Hooker; 3, Jas. Carmichael.

Yeld mares, 4 years old and over—1, W. Pringle; 2, J. McGerrigle; 3, Jas. Tait; 4, W. M. Kerr.

Mares, 2 years old, over 1,050 lbs.— 1, W. M. Kerr.

Geldings, 2 years old, over 1,050 lbs.—1, J. H. Nussey; 2, R. W. Whiteford; 3, J. Cavers.

Filly or colt, over 850 lbs.—1, R. W. Whiteford; 2, D. McCormick; 3, Jos. Tait.

Shire stallion, 2 years old—1 and 2, Dr. McEachran.

Shire mare and foal—1, Dr. McEachran.

Shire mare, 3 years old—1, Dr. McEachran.

Percheron stallion; 4 years old and over—1, 2 and 3, J. E. Arnold.

SMALL GRADES

Cow, 4 years—1 and 2, McMillan and Leggatt; 3 and 5, D. T. Ness; 4, C. Moe.

Cow, 3 years— 1, C. Moe.

Heifer, 2 years—1, D. Ness; 2, C. Moe.

Heifer, 1 year—1, C. Moe; 2, D. Ness.

Herd, any age—1, McMillan and Leggatt; 2, D. Ness; 3, C. Moe.

HOLSTEINS

Bull, 3 years—1, N. Sangster, Ormstown.

Bull, 2 years—1, J. J. Alexander, St. Louis Station; 2, Jno. McRae, Howick; 3, N. Sangster.

Bull, 1 year—1, P. J. Salley, Lachine; 2, A. Younie, Brysonville; 3, J. McRae; 4, N. Sangster.

Senior bull calf—1 and 2, N. Sangster; 3, A. Younie.

Junior bull calf—1, N. Sangster; 2, R. Kerr; 3, J. J. Alexander; 4, J. McRae.

Grand Championship 10 months' old calf—N. Sangster.

Cow, 4 years old, in milk—1, 2 and 4, N. Sangster; 3, A. Younie.

Cow, 3 years old, in milk—1, P. J. Salley; 2, J. McRae; 3 and 4, N. Sangster.

Cow, 2 years old, in milk—1, N. Sangster; 2, Jas. McWhinnie.

Cow, mature, dry—1 and 3, J. J. Alexander; 2, A. Younie; 4, J. McRae.

Heifer, 2 years, dry—1 and 3, N. Sangster; 2, J. J. Alexander.

Senior yearling heifer—1, P. J. Salley; 2 and 3, N. Sangster; 4, J. McRae.

Junior yearling heifer—1, A. Younie; 2, P. J. Salley; 3, N. Sangster; 4, J. McRae.

Senior heifer calf—1 and 3, J. McRae; 2 and 4, P. J. Salley.

Junior heifer calf—1 and 2, P. J. Salley; 3, N. Sangster; 4, J. McRae.

Senior grand championship female—P. J. Salley's "Canary Topsy Soldon."

Junior champion—A calf belonging to P. J. Salley.

Graded herd—1, N. Sangster; 2, J. J. Alexander; 3, J. McRae.

Young herd—1, P. J. Salley; 2, N. Sangster; 3, J. McRae.

Get of sire—1, N. Sangster; 2, P. J. Salley; 3, J. J. Alexander.

Produce of one cow—1, N. Sangster; 2, J. McRae; 3, A. Younie.

Dairy herd of 4 animals in milk—1, N. Sangster; 2, J. McRae.

LARGE GRADES

Cow 4 years—1 and 2, J. J. Alexander; 3 and 4, Thos. Rutherford; 5, J. W. Winter.

Cow, 3 years—1, J. J. Alexander; 2, J. W. Winter; 3, Thos. Rutherford.

Heifer, 2 years old—1, T. Rutherford; 2, J. J. Alexander; 3, J. W. Winter.

Herd—1, J. J. Alexander; 2, J. W. Winter.

Cows, 2 years old, in milk—1, D. Ness; 2, J. P. Cavers; 3, D. Ness; 4, Chas. Moe.

Mature cow, dry—1, McMillan and Leggatt; 2, W. F. Kay; 3, R. R. Ness; 4, Jas. McKell.

Heifer, 2 years old, dry—1, D. Ness; 2, J. P. Cavers; 3, D. Ness; 4, G. Montgomery.

Senior yearling heifer—1, H. Gordon; 2, J. P. Cavers; 3, D. Ness; 4, Chas. Moe.

Junior yearling, heifer—1 and 2, J. P. Cavers; 2, McMillan and Leggatt; 2, C. Moe.

Heifer calf, 6 months and under 12 months—1, R. R. Ness; 2, McMillan and Leggatt; 3, J. P. Cavers; 4, J. W. Logan.

Heifer calf, calendar year—1, McMillan and Leggatt; 2, D. T. Ness; 3, H. Gordon; 4, J. W. Logan.

Graded herd—1, H. Gordon; 2, Geo. Montgomery; 3, R. R. Ness; 4, McMillan and Leggatt; 5, Sir M. Allan.

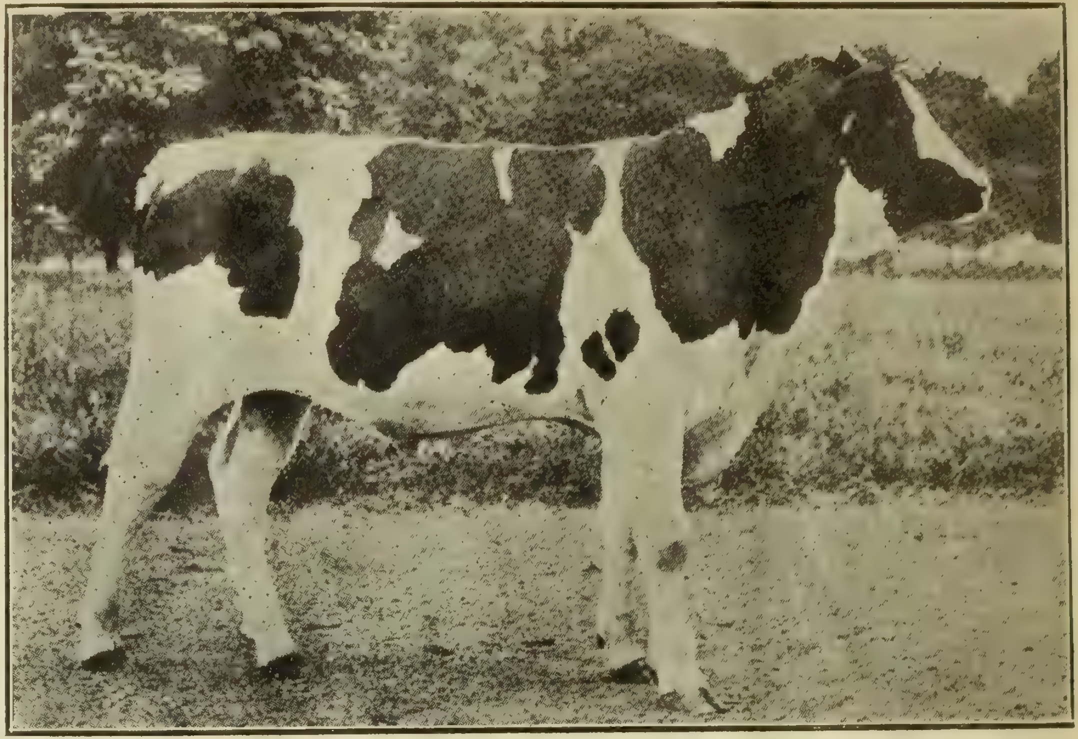
Progeny of sire—1, J. P. Cavers; 2, J. W. Logan; 3, R. R. Ness. (The sires were Cavers' "King's Crown"; Logan's "Netherhall Sir Douglas," and Ness' "Masterpiece.")

Produce of one cow—1, McMillan and Leggatt; 2, G. Montgomery; 3, J. W. Logan.

Young herd—1, H. Gordon; 2, J. P. Cavers; 3, R. R. Ness; 4, J. W. Logan; 5, G. Montgomery.

Bull championship—R. R. Ness' "Masterpiece."

Senior cow championship—McMillan and Leggatt's "Auchenbrain Hattie."



King Segis Pontiac Alcartra in his $10,000 form.

Junior female championship—D. Ness.

Dairy herd of four animals in milk—1, R. R. Ness; 2, H. Gordon; 3, J. P. Cavers.

Geo. H. Baird's special—Best display of Ayrshire cattle, bred and owned by exhibitor—1, G. Montgomery; 2, W. F. Kay; 3, R. R. Ness.

R. R. Ness' special—Best herd of grade Ayrshire milk cows—1, McMillan and Leggatt; 2, D. T. Ness.

J. B. Walsh's special—Best Ayrshire female, D. T. Ness.

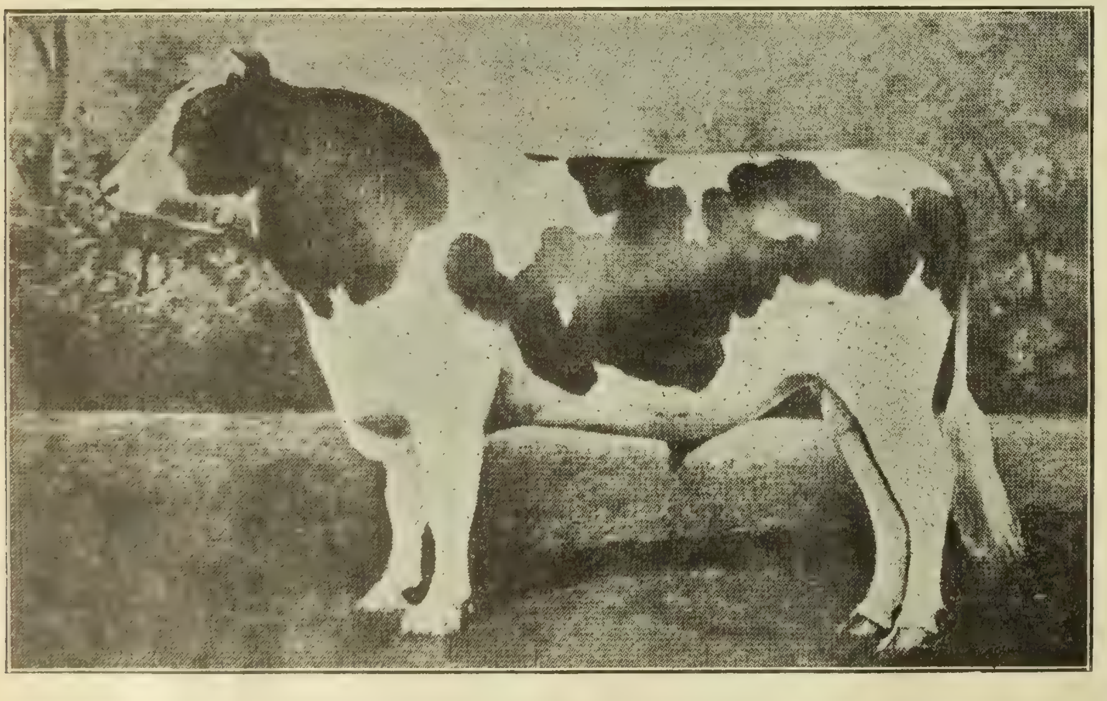
Mrs. Wm. Tannahill's special—Best Ayrshire milk cow, McMillan and Leggatt.

THE SALE

The top price at the Ormstown sale was $800. This was paid by J. J. Richards, of Red Deer, Alta, for Burnside Lucky Masterpiece, a calf less than six months old. This calf was first in its class. His value, however, is found in his ancestry. He is sired by Hobsland Masterpiece, champion of many shows, and his dam is Barcheski Lucky Girl, who won the championship at the Dairy Test at the Ottawa Winter Fair by milking 184.3 lbs. of milk testing 4.2 per cent in 72 hours. Other prices did not come up to the expectations of the consigners and bidding was not so brisk as might have been desired. This may have been due in some measure to the absence of United States buyers. Some of the best prices realized were as follows:

Glenhurst Pippin, consigned by Hector Gordon, sold for $215 to Prof. Barton; Miss Hall, by J. W. Logan, $180, to John McFarlane; Lessnessock, Flossie, D. T. Ness, $195, to D. Cumming, Lancaster; Barcheski Lily 13th, H. Gordon, $200, to D. Cumming; Burnside Diana, R. R. Ness, $350, to J. P. Cavers; Sybil of Fieldhouse, Chas. Moe, $195, to John MaFarlane; Anchencloigh Lily, R. R. Ness, $350, to D. Ness; Burnside Lady Pearl 9th, R. R. Ness, $230, W. F. Kay; Burnside Maggie Finlayston 4th, R. R. Ness, $210, to W. F. Kay; Maple Valley Jean, $300, to S. L. Stewart, New York; Pickens Preston, D. T. Ness, $225, to Dr. Forest, Montreal; Edgewood Lovely 1st, D. T. Ness, $210, to S. L. Stewart.

Other purchasers were: Jas. Boden, Danville, Que,; Chas. Moe. Ormstown, Que.; Malcolm Smith, Lachute, Que.; H. Lalonde; Steven Bull, Racine, Wis.; D. Boden, Lancaster, Ont.; L. E. Attwood, Chazy, N. Y.; C. A. Cavan, Kensington, Que.; Thos. Craig, Lancaster, Ont.



King Segis Pontiac Alcartra in his $50,000 form.

A GREAT HOLSTEIN BULL

The Evolution of a $50,000 Bull

ON May 13 last, L. L. Lawson of the Lawson Holding Company, Inc., Lagrangeville, N. Y., handed a check for $25,000 to John Arfmann of Middletown, N. Y., at the new sale pavilion, Liverpool, N. Y., in payment of a half interest in the Holstein bull, King Segis Pontiac Alcartra. The Lawsons, who have been breeding the Black-and-Whites for only about a year, are laying the foundations for an extensive and very high-class business; and this acquisition seems to be a master stroke; for King Segis Pontiac Alcartra has a record of achievement and profit probably unequalled. This is the second time he has made a world's price record. The first time was in June, 1911, when he was consigned (at 7 months old) by Stevens Brothers Company, Liverpool, N. Y., to the Breeders' Consignment Sale at Syracuse and was purchased by John Arfmann for $10.000. His young son, born Jan. 24, 1914, by the record breaking Lady Tobe DeKol (see p. 710, May 1st issue), has now exceeded this record by selling, at the 1914 sale, for $11,300. King Segis Pontiac Alcartra has since been generally known as "the $10,000-bull" and the "taint" of money has clung tenaciously to him and his progeny. His service fee is now $300. Eight of his young sons sold recently for $10,000 and nine for $12.000. Add these splendid revenues to the value of his young daughters retained in Mr. Arfmann's herd and it will be seen that "King" has paid his owner good interest on money invested. He weighs about 2200 lbs. and is, and always was, a handsome fellow, as will be seen by the two photographs reproduced in this issue, one showing him at 7 months of age and the other taken within the past 6 months.

The $50,000 bull was bred by the Stevens Brothers-Hastings Co.

ENCOURAGING WOOL GROWING

MR. James D. Thompson, overseer in the wool department of Messrs. Bates & Innes, Ltd., has just returned from Shawville, Que., where he has been the past week in the interests of the firm, grading and buying the wool brought together by the Pontiac Wool Growers' Association, under the auspices of Macdonald College, Que. This movement was started about a year ago, and Mr. J. K. King, Macdonald Demonstrator, and Mr. Macmillan, extension lecturer of the Live Stock Department of Macdonald College, have been visiting the farmers in Pontiac county and demonstrating to them how to clip and prepare the wool for the market. Formerly no care was taken after clipping the wool, and as a consequence the wool was marketed in a very unsatisfactory condition. Its value for manufacturing purposes was lowered through being mixed with straw, chaff, etc., and where it had been washed, it was felted so much in the process that the felting properties of the wool were destroyed. Now the farmers have been instructed not to wash the wool, but to send it in unwashed so that the fleece will be entire and more suitable to the manufacturer, as he could grade it into the qualities required for the different fabrics. The result of the efforts put forth by Macdonald College has been that 12,000 lbs of unwashed wool was brought into Shawville in four days, and another 5,000 lbs. of washed wool will be in by the 12th of the month. The wool was graded into four different grades by Mr. Jennings, expert wool grader for the Dominion, assisted by Mr. Thompson, and their opinion was that they had never handled a better grade of wool suited for the different classes of fabrics made in the country. Mr. Jennings and Mr. Thompson demonstrated the different qualities to the farmers, who took a lively interest in all that was said, and there is likely to be a great competition amongst them next year so as to obtain the higher prices. A record was given each of the quality his wool graded (also the breed of his sheep) and the price for each grade. The Pontiac Association also keeps a copy and one is sent to the Live Stock Commissioner, Ottawa, where it is kept on file, and next year they will be able to tell whether the farmer has improved the quality and bettered the marketing conditions of his wool. Next year the Association except to handle as much as 100,000 lbs. of wool.

Mr. Macmillan expects next year to have eight associations similar to the Pontiac one formed, which will take in as many different counties in the Province of Quebec. Messrs. Bates & Innes, who have taken a great interest in the movement, bought all the wool, 12,000 lbs., at record prices, and the farmers were all satisfied.

Carleton Place Herald

of June 9th 1914

OFFICIAL RECORDS OF HOLSTEIN-FRIESIAN COWS

From May 15th, to May 31 st, 1914

MATURE CLASS

Number and Name of Cow	AGE y.	m.	d.	Milk Lbs.	Fat Lbs.	Butter Lbs 80% Fat	OWNER
1. Lakeview Daisy 12051	6	0	6	696.0	22.64	28.30	
Thirty-day record	6	0	6	2924.9	91.31	114.14	Lakeview Farm, Bronte, Ont.
2. Queen Wilhelmina 8913	7	1	24	640.	21.73	27.17	
Fourteen-day record	7	1	24	1201.1	42.10	52.63	W. H. Cherry, Garnet, Ont.
3. Birdie 2nd's Netherland 8257	7	2	19	657.0	21.69	27.11	
Thirty-day record	7	2	19	2600.5	83.89	104.86	Colony Farm, Essondale, B. C.
4. Lansdowne Queen 9375	6	2	11	516.0	18.99	23.73	Brown Bros., Lyn, Ont.
5. Brooklands Sadie 5514	10	0	21	528.4	18.85	23.57	
Fourteen-day record	10	0	21	1049.5	36.25	45.31	Gordon H. Manhard, Vaudreuil, Que.
6. Utica Alice 6452	8	3	13	538.7	18.57	23.22	Martin McDowell, Woodstock, Ont.
7. Corea Fairmount DeKol 6904	8	1	25	539.2	17.71	22.14	Isaac Holland, Brownsville, Ont.
8. Pietertje DeKol Plus 10758	6	0	0	419.4	17.57	21.96	A. D. Foster, Bloomfield, Ont.
9. Clinton Girl 13905	7	0	3	417.7	17.23	21.53	F. Hamilton, St. Catharines, Ont.
10. Pauline Emery DeKol 13112	5	0	4	418.6	15.46	19.32	G. S. Gooderham, Bedford Park, Ont.
11. Madam Posch Pauline 10291							
Thirty-day record	5	11	8	3062.6	98.13	122.66	
Ninety-day record	5	11	8	9541.8	312.13	390.16	Colony Farm, Essondale, B. C.

SENIOR FOUR YEAR OLD CLASS

1. Oakvale Elsie Johanna 18027	4	7	27	643.8	23.33	29.17	Dr. L. de L. Harwood, Vaudreuil, Q.
2. Canary Violetta Mechthilde 14705	4	6	2	609.0	20.24	25.30	
Thirty-day record	4	6	2	2621.2	82.39	102.96	J. M. Steves, Steveston, B. C.
3. Anniebelle Colantha 14726	4	6	3	404.9	16.56	20.71	A. E. Hulet, Norwich, Ont.

JUNIOR FOUR YEAR OLD CLASS

1. Emma Pauline DeKol 16033	4	2	15	567.6	21.33	26.66	
Thirty-day record	4	2	15	2553.5	85.06	106.33	Lakeview Farm, Bronte, Ont.
2. Pontiac Alice 15011	4	4	10	471.7	17.38	21.73	Martin McDowell, Woodstock, Ont.
3. Victoria Pansy Posch 16514	4	1	5	323.6	12.96	16.20	F. Hamilton, St. Catharines, Ont.

SENIOR THREE YEAR OLD CLASS

1. Lakeview DeKol Duchess 14719	3	6	17	489.6	19.62	24.53	
Thirty-day record	3	6	17	2016.4	76.53	95.67	Lakeview Farm, Bronte, Ont.
2. Netherland Faforit 14766	3	9	14	467.4	19.02	23.78	A. E. Hulet, Norwich, Ont.
3. Lottie Canary 2nd 17311	3	6	3	492.8	17.54	21.92	J. M. Steves, Steveston, B.C.
4. Ina Woodcrest Pietje 26259	3	11	20	495.9	15.49	19.37	Dr. E. de L. Harwood, Vaudreuil, Q.
5. Coral DeKol 3rd 17244	3	11	19	367.9	14.23	17.79	
Fourteen-day record	3	11	19	738.1	27.91	34.89	G. S. Gooderham, Bedford Park, Ont.

JUNIOR THREE YEAR OLD CLASS

1. Belle Abbekerk 19562	3	0	13	393.9	16.87	21.09	H. Clare, Norwich, Ont.
2. Cora Echo Korndyke 24281	3	0	25	343.1	14.89	18.62	E. A. Lloyd, Stouffville, Ont.
3. Segis Keyes Walker 19559	3	0	24	503.7	13.27	16.59	Benj. R. Leavens, Bloomfield, Ont.
4. Centre View Daisy Segis 18143	3	4	20	373.2	12.87	16.09	A. E. Hulet, Norwich, Ont.
5. Sunnydale Queen 2nd 17619	3	1	4	426.4	12.09	15.12	A. D. Foster, Bloomfield, Ont.
6. Centre View Jewel Cornucopia 18144	3	2	9	341.8	10.93	13.66	A. E. Hulet, Norwich, Ont.

SENIOR TWO YEAR OLD CLASS

1. Princess Segis Walker 18093	2	10	26	581.3	16.36	20.46	Ed. B. Purtelle, Bloomfield, Ont.
2. Abberkerk Jewel 20284	2	11	13	430.8	16.24	20.30	W. G. Bailey, Paris, Ont.
3. Bedford Gem 2nd 17251	2	11	13	382.5	15.83	19.79	
Fourteen-day record	2	11	13	754.6	31.22	39.03	G. S. Gooderham, Bedford Park, Ont.
4. Oakhurst Butter Girl 3rd 25328	2	10	24	317.2	14.67	18.34	W. C. Prouse, Tillsonburg, Ont.
5. Lillian Hengerveld Burke 18864	2	11	14	378.3	14.15	17.69	J. M. Branscombe, Bloomfield, Ont.
6. Pontiac Segis Prescott 19560	2	11	24	457.5	13.83	17.29	Benj. R. Leavens, Bloomfield, Ont.
7. Woodcrest Pietje Friesland 25559	2	9	26	478.1	13.83	17.29	Donat Raymond, Montreal, Que.
8. Keyes Segis Walker Pietertje 18091	2	11	18	492.4	13.42	16.78	Ed. B. Purtelle, Bloomfield, Ont.
9. Sara Jewel Hengerveld 2nd C. 20928	2	10	28	306.6	11.65	14.56	W. W. Brown, Lyn, Ont.
10. Trixie DeKol Violet 2nd 20321	2	11	13	316.2	11.34	14.17	Isaac Holland, Brownsville, Ont.
11. Pauline Ormsby 23142	2	10	13	350.7	11.15	13.94	Martin McDowell, Woodstock, Ont.
12. Mary Dorliska 18820	2	11	12	252.4	9.05	11.31	David Caughell, St. Thomas, Ont.

JUNIOR TWO YEAR OLD CLASS

1. Pietje Inka Pietertje 22881	1	7	0	350.2	14.67	18.33	
Fifteen-day record	1	7	0	750.0	29.79	37.23	W. W. Brown, Lyn, Ont.
2. Susie Dorliska 24016	2	1	26	326.1	14.41	18.02	David Caughell, St. Thomas, Ont.
3. Lakeview Dutchland Queen 21115	2	2	8	446.2	13.87	17.33	Lakeview Farm, Bronte, Ont.
4. Lyndenwood Queen 23501	2	0	19	276.1	12.01	15.01	W. J. Bailey, Nober, Ont.
5. Keyes Segis Walker Pietertje 2nd 20718	2	0	0	323.3	11.75	14.69	Ed. B. Purtelle, Bloomfield, Ont.
6. Lakeview Netherland 21110	2	3	29	325.0	11.39	14.24	Lakeview Farm, Bronte, Ont.
7. Molly Mercedes 24020	1	9	23	368.4	11.20	14.01	David Caughell, Woodstock, Ont.
8. Clara Houwtje Wayne 24242	1	11	13	367.3	10.76	13.43	David Caughell, Woodstock, Ont.
9. Dorliska Wayne 24018	1	11	16	291.0	10.24	12.80	David Caughell, Woodstock, Ont.
10. Augusta of Lulu 2nd 21938	2	4	19	352.2	10.11	12.63	J. M. Steves, Steveston, B. C.
11. Mercedes Pontiac DeKol 21440	2	0	0	267.4	9.82	12.28	Isaac Bateman, Innisfail, Alta.
12. Molly Teake Mercena 23611	2	1	20	267.3	9.15	11.43	Isaac Holland, Brownsville, Ont.

During the last half of May the records of 52 cows and heifers were received and accepted for entry in the Record of Merit. The leader in the mature class is Lakeview Daisy with 28.30 lbs. butter in 7 days and 114.14 lbs. in 30 days. Several days during the test this cow exceeded 100 lbs. milk daily. Other good cows in this class are Queen Wilhelmina and Birdie 2nd's Netherland each with over 27 lbs. butter. Madam Posch Pauline makes another thirty-day record of 122.66 lbs. butter, bringing her total for 90 days up to 9541.8 lbs. milk and 390. 16 lbs. butter. In the senior four-year-old class Oakvale Elsie Johanna leads with 29.17 lbs. and in the junior class Emma Pauline DeKol stands highest with 26.66 lbs. in seven days and 106.33 in thirty days. Among the senior three-year-olds the best is Lakeview DeKol Duchess with 24.53 lbs. in seven days and 95.67 lbs. in thirty days, while Belle Abbekerk leads the juniors with 21.09 lbs. Princess Segis Walker is first in the senior two-year-olds with 20.46 lbs. closely followed by Abbekerk Jewel with 20.30 lbs. The best junior is Pietje Inka Pietertje with 18.33 lbs.

THE DAIRY

DISINFECTION OF CREAMERIES AND CHEESE FACTORIES

To Factory Owners and Makers of Dairy Products:—

In view of the fact that complaints have been made in the trade concerning the quality of a portion of our dairy products, and that it has been demonstrated that the best products are made in those factories which are kept very clean, the Hon. J. Ed. Caron, Minister of Agriculture, has decided to make an appeal to the proprietors of creameries and cheese factories, and to the makers and the inspectors who have supervision of these factories, to urge them to eliminate everything that can injure the quality of the butter and cheese.

To this end he strongly recommends the use of pure culture (starter) in the manufacture of cheese and butter, and particularly in the manufacture of pasteurized butter.

It is of equal importance that every factory should undergo a complete disinfection at least once a year, before the opening of the season.

The plant used in the manufacturing process should be disinfected daily with steam under a pressure of at least 25 lbs.

The walls and ceiling may be disinfected by one of the following methods:—

1. Thoroughly washing and then disinfecting with sulphurous acid, produced by burning sulphur.
2. Liberating formalin vapour. Formalin disinfection can be made easier by using a special formalin fumigator, which can be obtained from a druggist.
3. Using 5% formalin in whitewash.
4. Painting.
5. Whitewashing with lime, using ½ lb. of chloride of lime to every gallon of milk of lime.
6. Disinfecting the cement floors by sprinkling powdered sulphate of iron (copperas) over the whole surface, putting a little extra on greasy spots.

The surroundings of the factory may be disinfected by treating all bad-smelling places with boiling water to which copper sulphate has been added—a good handful to each pail of water.

J. ANTONIO GRENIER,

Secretary of the Department
of Agriculture,
Quebec

RECORD OF PERFORMANCE TEST

Ayrshire cows and heifers that have qualified in this test during May, 1914

Name of Cow	Owner	Lbs. Milk	Lbs. Fat	% Fat	No. Days
Mature Class					
Flossie of Burnbrae—24891	Wilson McPherson & Sons, R. R. No. I, St. Anns, Ont.	14415.	509.	3.53	364
Buttercup of Ingleside—20476	Laurie Bros., Malvern, Ont.	11594.	427.	3.68	365
Scottie's Dandy 2nd—25690		9921.	387.	3.90	318
4 Year Old Class					
White Rose—26614	Hon. Wm. Owens, Montebello, Que.	12636.	492.	3.89	363
Woodland Belle—33770	Alex. Hume & Co., Menie, Ont.	10087.	386.	3.48	365
Queen of Silver Springs—30075	T. C. Treverton, R.R. No. I, Latta, Ont.	8734.	305.	3.48	365
2 Year Old Class					
Nellie Gray of Hickory Hill 2nd—38201	N. Dyment, R. R., Hamilton, Ont.	8056.	390.	4.84	365
Mabel of Maple Avenue—32877	S. A. Cleland, Hemmingford, Que.	7298.	343.	4.69	365
Beauty—34229	Jos. Hudson & Son, Lyn, Ont.	6621.	317.	4.78	284
Ida of Maple Hill—31875	S. A. Cleland, Hemmingford, Que.	6383.	318.	4.97	363
Stately of Maple Hill—35666	S. A. Cleland, Hemmingford, Que.	6075.	300.	4.93	365

A ten thousand pound record was thought to be something wonderful a few years ago, but now we find a 10,000 pound record for a mature cow is the exception.

It is interesting to notice that as now names both of cows and owners appear they keep up the high average, and follow in the line of large yields of both milk and butter.

It is interesting to notice that so large a percentage of the cows on test qualify in the Record of Performance test.

It indicates that there are many wonderful dairy cows whose dairy ability would have never been brought to notice had it not been for this test.

W. F. STEPHEN,
Secretary,

Canadian Ayrshire Breeders' Association
Huntingdon, Que., June 4th, 1914.

INSPECTOR OF THE WEIGHING OF BUTTER AND CHEESE APPOINTED

The Hon. Martin Burrell, Minister of Agriculture, has appointed Mr. J. E. D. Gareau, "Inspector of Weighing of Butter and Cheese", in accordance with the recommendations made by the Royal Commission which inquired into this question a short time ago.

Mr. Gareau is now ready to investigate complaints of excessive "short weights" or discrepancies between the marked weights of butter and cheese and the weights as found by the Public Weigher at Montreal. Cheese factory and creamery salesmen and receivers of butter and cheese are requested to notify him at the Department of Agriculture, 223 Commissioners Street, Montreal, Que., (Phone Main 4145) if they have any complaints to make respecting the weighing of these articles.

The Inspector has instructions to keep in touch with the work of the Public Weigher at Montreal, and in cases where he finds any evidence of excessive short weight it will be his duty to investigate without specific request.

Mr. Gareau is a graduate of the Burlington, Vt., and St. Hyacinthe Dairy Schools. He has been a cheesemaker and an Inspector for the Dairymen's Associations of the Province of Quebec, and has also had many years experience in the cheese and butter trade

He will not act as a referee in the matter of quality.

CLEANLINESS IN THE DAIRY

At this time of the year, and especially during the hot weather such as will most likely follow, some farmers often get complaints from their customers of sour milk. There are various reasons as to the cause. In my opinion, the person who is entrusted with the washing of the cans is in many a case to blame. To begin with, the milking pails should be kept perfectly sweet and clean, otherwise it is useless to make trouble over the churns and delivery cans in which the milk is to be distributed. The cans should first be washed in cold water, to take all the milk off, then in water as hot as the hand will allow (with a good sized piece of soda added to the water); they should be scrubbed out thoroughly, being particular to clean out all the seams. The brush must be kept expressly for this purpose. When all traces of the milk have been removed, the cans should be scalded, the water to be boiling for this purpose. This done, all cans should be placed out of doors, wrong side up, to drain. Some people make a practice of drying out the cans with a cloth after scalding. This is a great mistake. After the scalding process a cloth should never touch them inside. It is very important that the cans be washed as soon as possible after being used. If allowed to stand unwashed the milk becomes baked on, and ordinary washing will not cleanse. If this should happen, salt should then be used, and the sieves should be cleaned regularly, to allow the milk to pass through freely. Another fault may be that the milk is insufficiently cooled. If a cooler is not in one's possession, then try placing the milk in the well, the water being on a level with the milk in the can. A stream of cold water should be kept running all the time the milk is cooling, otherwise the water gets warm, and it is useless to try to cool milk in warm water. Another point is to see that all the milk is of the same degree before being mixed, that is to say, one can of milk should not be allowed to stand in the well for an hour and the next for ten minutes and then poured together. If these few notes were carried out, I think there need be no complaints of sour milk, not even in the hottest of weather.

MILK PER ACRE

If it may be assumed that the farm of the average factory patron is fairly well adapted to dairying, that the patron himself is inclined towards dairying, rather than, let us say, fruit growing, and that his cows are fairly good; then it will be of interest to note how the farm is made to respond to this dairy inclination.

There are frequently noticed yields as low as 250 pounds of milk per acre cultivated including pasture, but some good patrons obtain 750 and 800 pounds per acre. Even this is little enough, for there are plenty of authentic records of 1,100 and 2,100 pounds of milk per acre. It should not be extremely difficult to obtain more than this, even 2,500 or 3,000 pounds.

This latter figure is a long, long way ahead of the yields already mentioned of only 250 pounds which may be found on many a so-called dairy farm in Canada, and is indicative of the possibilities in reach of the factory patron who is really anxious to attain first rank.

It is questionable if the average yield per acre in Ontario is much more than 600 pounds of milk. If loyal whole-hearted support is given to the local factory and to our national industry of dairying, the farm and the dairy herd will be made far more productive. Great help will be derived by keeping individual records of each cow, because the old-established, complacent "average" cow has no intention whatever of assisting the average patron to get 3,000 pounds of milk from the average acre. The first necessary step is to know for certain that each cow is a good producer, then one may aim with more hope at $30 or $40 per acre.

C. F. W.

A SIX MONTHS' HOIST

During April and May a great many poor cows have been milked, giving, in some cases, only 600 pounds of milk and 17 pounds of fat in the month; some have contented themselves with producing even less than this.

One wonders if the owners of such cows are contented with records like that, and if the owners of the various factories concerned are content to let their plants be run with such poor support.

It is a common occurrence to find groups of 50 and 100 cows at a factory giving on the average 300 pounds of milk more than similar groups supplying the same factory.

Supposing a factory is supported by only 200 cows; it should thus be comparatively easy to have an extra three thousand six hundred dollars flowing through it in six months to the patrons if they had better cows. That is a good "six months' hoist".

The factory management is therefore directly interested in recommending cow testing to the patrons and in providing for its operation. Some of the good records received at the dairy division, Ottawa, (where full information may be obtained about cow testing) for April and May, are:—90 cows at Ayer's Cliff, Que., with an average of 25 pounds of fat, 85 cows at Atwood, Ont., with 30 pounds of fat, 53 at Wallace, Ont., giving 1,005 pounds of milk and 32 pounds of fat. Three grade cows at Cornwall, Ont., averaged 40 pounds of fat, and a five-year-old grade at Peterboro, Ont., gave 1,690 pounds of milk and 62 pounds of fat. This cow gave more than four times as much fat as many poor cows in the month.

C. F. W.

INDIVIDUAL FAIR PLAY

IN a herd of 12 dairy cows the average yield last year was 3,780 pounds of milk and 144 pounds of fat. The 10 best cows in the district averaged 6,293 pounds of milk and 221 pounds of fat, while the 10 poorest gave only 2,818 pounds of milk and 107 pounds of fat.

When it is seen that the *difference* in the average of these two groups of 10 cows is 3,475 pounds of milk, while between the best and poorest individual cow there was actually a difference of 6,195 pounds of milk, it is quite evident that figuring out just a could, dead, machine—like "average" is quite unsuitable and unfair when it comes to dealing with a living, nervous, sensitive cow.

That difference of $61.95 between the earning power of two individual cows indicates the cow's natural rebellion against mere mechanical treatment. Being an animated and complex bundle of nerves and tissues she needs study of her particular ilkes and dislikes, then her best results will be cheerfully given. She is not simply one of a team, but an individual whose peculiarities are well worth studying to ensure development.

The average may be used in giving due justice to each cow only when all in the herd are equally good. Just as long as these remarkable differences exist between individual cows, there will also remain the need for a record of cost of feed and production of milk of each one separately. Then the herd can be built up on the definite system of each one contributing a good measure of profit; otherwise the deficiencies of several poor cows add to the heavy burden shouldered by the two or three star workers of the team that do make large profits. Dairy records give fair play to each cow and help in judging individual merit.

C. F. W.

THE MANUFACTURE OF CAMEMBERT CHEESE IN CANADA

HARD cheeses, especially Cheddar cheeses, have been made in this country for many years. The home market was almost monopolized by them, and little was known of the many varieties of soft cheese, which are consumed in Europe and which make a profitable industry for thousands of dairymen. With the increase, however, in foreign population a moderate demand for soft cheeses has developed. Canadians who travel abroad, and they are increasing yearly in numbers, acquire a taste for these strong-smelling, strong-tasting products. As a result, to satisfy this demand, soft cheeses were imported from Europe and these importations have been growing yearly.

Soft cheese, as well as hard cheese, is entitled to a place on our table. Cheese is a valuable food, because it contains so much protein, but its principal asset is its flavor. An agreeable flavor will help considerably in the proper digestion and assimilation of food. Therefore the value of cheese with a characteristic strong flavor cannot be overestimated, as it helps to digest the coarser unflavored dishes. Soft cheeses with their intense flavors so thoroughly enjoyed by certain people have therefore a decided value. However, they have value only for persons who enjoy these extreme flavors, and a constant use of soft cheese by persons to whom the flavor is repugnant will do more harm than good.

Soft cheese, as the name indicates, is soft, often so soft that it can be spread upon bread or crackers like butter. Further, soft cheeses are much smaller than hard cheeses, and what is more important, they do not keep well. This is due to the fact that so much moisture is left in the curd in the manufacture. When making hard cheeses efforts are directed to remove much moisture as quickly as possible. The milk is curdled rapidly, the mass is cut in small pieces and heated in order to separate the whey from the curd. Finally the curd is pressed, leaving a mass of dry hard curd. On account of this previous treatment such a curd ripens slowly, and even when perfectly ripe is hard and preserves its shape. In making soft cheeses much whey is left in the curd, which is neither cut, heated nor pressed. The soft texture and high water content make the curd a favorite medium for the development of micro-organisms, and the cheeses ripen quickly developing very high flavors. However, the same conditions which cause soft cheeses to ripen in a very short time make it impossible to keep these cheeses for any length of time, so that they have to be consumed when ready for the market. If insufficiently ripened they do not have the proper flavor and texture; when overripe they become liquid and decay rapidly but when just right they are very appetizing. We shall see how this poor-keeping quality is the principal ally of our domestic soft-cheese maker.

The Advantages of Making Soft Cheeses

For many years it was considered impossible to make soft cheeses outside of Europe, and as a rule all attemps at soft cheese making in Canada produced a queer flat-tasting product of uncertain quality. Luckily, the Experiment stations have proved conclusively that several types of European soft cheeses, especially Camembert Cheese, can be manufactured successfully in this country, if only the proper precautions are taken and the process is understood. If one keeps these points in mind it may be readily seen that there is considerable profit awaiting the soft-cheese maker.

Soft cheeses are selling at present at 50 cts per lb., a very high price when compared with the market value of hard cheeses, and this is the more peculiar as it is cheaper and easier to make soft cheeses.

As we mentioned before, soft cheeses contain much water, sold to the customer at 50 cts. a lb.; thus from the same quantity of milk we make many more pounds of soft cheese than hard cheese. In the second place, less capital is tied up in ripening cheese as soft cheeses ripen so quickly. Further, on account of the poor-keeping quality every dairyman can build up a trade in his own neighborhood without fear of outside competition. If he is careful to maintain a uniform quality in his cheese his out-put will be sold before it is ready for delivery.

We are convinced that there will be in the near future a great demand for first quality Camembert cheese. Thousands of dollars worth of Camembert cheese are imported yearly from France, and that in spite of the fact that the cheese must be shipped before it is duly ripened, so that for the buyer here it is a lottery whether he will eat his Camembert through a straw or will find only a ball of sour curd inside the packing. If the consumer is willing to take such chances with a delicacy which costs him 50 cts a lb., what will his attitude be if he has the certainty of receiving always a first class product? With such a guarantee the consumption of Camembert cheese will increase tenfold.

Camembert is a type of soft cheese, which can be made in Canada without the least trouble. The cheese measures about 4½ inches in diameter by a thickness of 1½ inches and after removing the wrappings a solid hard rind appears about 1-8 inch thick, made of mould threads supporting pieces of hardened cheese. Within, the cheese has a yellowish cream color, is of a waxy or buttery texture, and has a distinct characteristic flavor.

To make the cheese, two quarts of clean milk should be allowed for each cheese. The milk is poured into a cheese vat and heated to 85°F., a good temperature for the growth of the lactic acid bacteria. Then a starter is added at the rate of 3 quarts per 100 lbs of milk and the acidity of the milk determined from time to time. When the acidity has reached 0.40% or 0.45%, the temperature is again brought back to 85°F. and rennet added. Only so much rennet should be added that it will take 1½ to 2 hours to curdle the milk (8-10 c.c. extract). The curd can be cut if desired, but in this case less cheese will be made from the same quantity of milk and also some fat will be lost in the whey, but the cheesemaker will save one day in the making of his cheese. As the space in the making room is often limited, a day saved may mean an increased production of about 30%. In case the curd is cut, the rennet can be added when the milk has an acidity of 0.30%.

The curd is then dipped into the forms, which are placed on mats on draining boards. The dipper fits exactly in the forms and one slice of curd is put in each, care being taken not to break it. After each form has received one slice of curd, the same is repeated until finally all the forms are filled to the top. The cheeses are left until the next morning to allow the whey to drain off. Then the cheeses are inoculated with moulds and turned.

The moulds necessary for the production of real Camembert cheese are of two kinds; one is a special variety of green mould, called *Penicillium candidum*, a mould not found in this country in nature, and the other is the well known white milk mould, *Oidium lactis*. The green mould should be cultivated on bread boiled in water and the Oidium on cheese. To inoculate the new cheeses a pepper box is filled with boiled water, pieces of mould bread and cheese broken up in it, and then this infected water is sprinkled over the surface of each cheese. After the cheeses are turned the inoculation of the lower surface is performed in the same way.

After turning, the cheeses are left another day, and by the next morning they will have shrunk to their proper thickness. If not sufficiently firm by that time they are turned again and left another day.

When sufficiently firm, two cheeses are put together and the edges rolled in coarse salt and also the exposed surfaces rubbed over it. After salting, the cheses are placed on dry boards, bottom up, and left until the next day when most of the salt will have diffused in the cheese. Again the cheeses have to be moved to dry boards, in order to prevent mould growth on the boards, and are placed in the first ripening room, where a temperature of 60-62°F. is maintained and the air is saturated with moisture. It is advisable to place the cheeses on cane bottoms, as moulds are liable to grow from the cheeses into the boards and make a daily turning necessary. At the end of the first week moulds begin to appear on the surface of the cheeses. During the first half of the second week the mould grows rapidly covering the whole cheese with a snow-white, cotton—like layer. This cover turns green by the end of the second week, and the cheeses begin to show actual ripening and grow soft just under the rind. At this stage the cheeses are wrapped in tin foil or parchment paper. If a very high-flavored cheese is desired, this wrapping should take place sooner, when the mould is still white. The reason for this is that the wrapping checks the growth of the green mould

POULTRY

A HOUSE FOR LAYING HENS

A plan of a permanent laying house for poultry, with brief description and an estimate of material required for the house as planned, is contained in pamphlet No. 5 of the Poultry Division of the Live Stock Branch of the Dominion Department of Agriculture. This plan has been specially prepared for use in the Province of Prince Edward Island by W. A. Brown and T. A. Benson; however, it includes a number of features, which in the opinion of the writers could be advantageously adopted throughout the greater part of the Dominion of Canada. Copies of this pamphlet may be obtained free upon application to the Publications Branch, Department of Agriculture, Ottawa.

A NEW BREED

THE Poultry Department of Macdonald College has been presented with a pen of Light Brahmas of high quality by Mr. D.T. Taylor of Quebec, Que. This gift from Mr. Taylor makes a valuable addition to the breeds now maintained on the College plant, since there is now represented one of the best varieties of the meat type, and moreover, the high quality of Mr. Taylor's Light Brahmas has been demonstrated long since.

ENGLISH LAYERS

THE results of three large egg-laying contests are extremely interesting. Up to the present time the English birds have demonstrated their superiority from an egg-producing standpoint. English Leghorns hold first and second places in the World's Egg Laying Contest being conducted at the Missouri Experiment Station. An English pen of White Wyandottes is in the lead by over 100 eggs in the Egg-Laying Contest being conducted at Storrs Agricultural Experiment Station, Storrs, Conn. In the International Egg Laying Contest being held at Victoria, B.C., a pen of English White Wyandottes is first among the weight varieties. In this contest, however, a pen of White Leghorns from New Zealand is in the lead of all varieties with a pen of White Leghorns from England, coming 7th. In the Storrs contest a few of the heaviest laying Leghorn pens, now owned by American breeders, are of English stock, and since the English birds have won the majority of first places in five competitions held during the past two years, it must be conceded that there is something tangible in their methods of breeding as compared with the American methods. This fact is obvious whether we approve of egg-laying contests or not.

DEMONSTRATION HOUSES

THE demonstrators who are running the demonstration houses in co-operation with the Poultry Department of Macdonald College are meeting with good success. The majority of the demonstrators have obtained fairly satisfactory results during the winter season. They have also hatched quite a number of chicks and will be in a good position in the fall of the year to fill their houses with well-developed pullets. These houses are open for public inspection at any time and the owners will be glad to give all possible particulars in regard to the construction of the houses. The owners of the houses with their location are as follows:—

Mr. Bert Hodgins, Shawville;
Mr. J. C. Boyce, Athelstan;
Mr. G. M. Beach, Cowansville;
Mr. Edgar B. Standish, Rougemont;
Mr. W. G. Loomis, Capelton;
Mr. E. N. Chaddock, Cookshire.

MARKETING BROILERS IN QUEBEC

THE broiler market in the Province of Quebec is somewhat limited. Montreal offers fairly good prices for broilers at certain seasons of the year. Also there are many summer resorts in different parts of the province where broilers can be disposed of at good prices. A broiler is a young chicken weighing about 1 to 2 lbs. The smaller broilers are known as squab-broilers and usually command a higher price. In the larger markets they are usually sold to high class hotels or restaurants where one squab-broiler is served to each individual. Under certain conditions it may be advisable to dispose of the cockerels and whatever pullets are not being kept over for laying, as broilers. This will apply particularly to those who are raising White Leghorns or other light breeds. These non-weight breeds are quick-maturing and small-boned, and when the chicks are from 8 to 12 weeks of age they make fine broilers. Wyandottes are often sold as broilers though they do not mature as quickly as Leghorns.

It is a good practice to fatten the broilers 9 or 10 days before selling them. If they are placed in a small pen and fed a good fattening ration for a few days they will put on considerable flesh. Broilers may be sold alive or dressed, depending upon local market requirements and the prices.

M. A. JULL

---

and encourages in this way the *Oidium lactis*, and it is just the Oidium which is responsible for the peculiar strong flavor.

After being wrapped up, the cheeses are transferred to the second curing room, where a temperature of 56-60°F. is maintained. In this room the moisture content may be also lower, as long as there is sufficient moisture to keep the cheeses from drying out. At the end of the third week the cheeses are two-thirds ripened. When cutting through a cheese at this stage, we find an inch layer of buttery soft substance under the layer of mould, surrounding a ball of sour, hard curd. As soon as this centre of sour, hard curd has disappeared altogether, the cheese is ready for the consumer. When the cheeses are nearly ripe, red slimy spots appear on the rind, which spots are apparently of no consequence whatever.

The bacteriology of the process is very simple. First the lactic acid bacteria from the starter produce much acid, and when the moulds begin to grow they produce at first also acid. Soon afterwards, however, the moulds begin to assimilate acid, the acidity gets less and less and finally disappears altogether. The change of the firm, solid curd into the soft buttery substance is performed by an enzyme produced by the green mould and also the Oidium. The mould itself does not penetrate the cheese at all, and therefore there is no truth in the statement made by various investigators, that consumers of Camembert cheese eat more mould than cheese. Also bacteria, which appear in large numbers on the surface, are not found in the interior.

Before concluding, we should like to emphasize the following points:

1. First class Camembert cheese can be made in this country,
2. The making of Camembert cheese is a very profitable business,
3. The cheese must be inoculated with Camembert mould at the proper moment, which mould is not found in Canada,
4. The ripening rooms must be kept scrupulously clean in order to prevent infection with local moulds and bacteria,
5. The temperature and moisture in the ripening rooms must be kept uniform.

This article is not intended to supply detailed information as to how to make Camembert cheese, but simply to serve as an eye-opener in regard to this profitable industry. Any one anxious to try a practical experiment can apply for assistance at the Department in Ottawa, where they are only too anxious to help ambitious dairymen.

J. VANDERLECK,

Macdonald College

COST REDUCERS

SO many dairymen wonder what the factory is going to pay, so many salesmen fight for another sixteenth of a cent on the price of cheese, that some milk producers in thinking almost entirely of selling price, are apt to overlook cost.

The twin sisters of economical milk production are good cows and individual records. Cows may be fed right and fed alike, yet fail to produce milk economically, that is at low cost, because they were not built on dairy lines. But even with the average run of dairy cows that seem to produce just about the same quantity of milk, there are so many strange variations that the keeping of milk records is not only advisable from the business standpoint, but becomes of fascinating interest.

When a simple feed record is kept in addition to the milk record, the actual cost of milk as produced by each cow is ascertained easily, so that the owner may be assured that he is keeping only such cows as yield plenty of milk at a low cost. Can you tell offhand whether the milk of some of your cows costs 62 cents or 97 cents per 100 pounds? If your profit over cost of feed is now only $10.00 per cow, you can make it $20.00 by keeping records. Send to the Dairy Commissioner, Ottawa, for milk and feed record forms which are free. They are cost reducers.

C. F. W.

QUACK GRASS

THERE is no easy way of killing quack grass. If you have not the time to go at it now and thoroughly kill it out, you can do nothing better than to seed your land down to timothy or timothy and clover, preferably the combination, and leave it until you can get around to thoroughly kill out the quack grass. Half-way methods of killing quack grass only scatter it and cause it to grow more vigorously. You can seed this piece down for hay for a few years, and when you get ready to clean it up take off the first crop of hay, then plow it at once and keep it thoroughly disced for the balance of the season so that no grass will have a chance to appear above the surface of the ground. Such treatment followed by a cultivated crop the following season, such as potatoes or corn, should entirely eradicate the quack grass. This treatment will require from ten to fifteen dollars worth of cultivation per acre.

PRESERVING EGGS IN WATERGLASS

MIX one pound of waterglass to one gallon of water. Use hot water. Of course this solution must be perfectly cool before you put the eggs in. Then fill wooden buckets, or a clean vessel of any kind (except metal vessels); you should only fill them about one-third full, because when you put the eggs in the solution of course rises. You can put the eggs in daily as gathered.

Always let the eggs cool for 12 hours before putting them in the waterglass solution. Do not put any very thin shelled eggs in, no dirty eggs, or cracked ones. Be careful not to crack any when placing them in the solution.

If you have large quantities of eggs, you can carefully put the eggs in the vessels first, then pour the waterglass solution on after.

Eggs over two days old are not nearly as good, and do not compare with eggs put into the solution that are only 12 to 24 hours old. Stale eggs are always a failure.

The best eggs for preserving are from hens that have no male bird running with them. Infertile eggs keep better than those containing the life germ. The purity and freshness of the fresh egg can be obtained even after six months if these few hints are taken.

The effects of waterglass is simply to form an air tight covering, hermetically sealing the shell. Care should be taken to see that the eggs are kept covered; an inch or two of solution should always be above the eggs. Store the eggs in cool cellar, free from heat or frost.

Wash all eggs before using. Prick the shell with a needle before boiling, as they are liable to crack or burst whilst boiling. Cover all egg vessels containing the eggs in solution to prevent dust and dirt getting into the eggs. You see the farmer is the man to preserve eggs; the wholesaler often has to wait for days before the so-called fresh egg reaches him, but the farmer, if he follows these instructions, can have fresh eggs all the year round.

The trouble of waterglass is as nothing compared with the bother of lime. Besides the eggs are much better in every way. The expense is a mere trifle.

Success is certain if you use fresh eggs. The reason the ordinary store egg is not so good is simply because they were not put into solution till they had become stale. You can put down 10,000 eggs at a cost of a few dollars.

Remember once the eggs are removed from the waterglass, they are liable to go bad as quickly, if not quicker, than a fresh egg. So only remove them from the solution just before required for use or sale

EGG-LAYING ABILITY IS INHERITED

IT is a well established fact that there is a great difference in egg production among various breeds of poultry. The great majority of people who have raised poultry have realized that some breeds will lay better than others. More observant poultry raisers have found that there are differences within strains of the same breed. They have found, for instance, that one strain of Barred Plymouth Rocks will lay better than another strain of the same breed. The same will apply to Leghorns and any other breed of poultry. Hence, we appreciate the fact that strain is of more importance than breed.

Considerable work from a scientific standpoint has been conducted in regard to breeding for increased egg production. Progress along this line is not as substantial as might be expected. Nevertheless, the data obtained is of great importance in the breeding of poultry. The original policy in breeding for increased egg production was to select the heaviest layers for breeding purposes. This line of work was termed "mass selection", but after eleven years of this method of breeding the egg production had actually decreased below that with which it had started. It was found, therefore, that "mass selection" was not improving egg-laying capacities. The data clearly showed that the daughters had not always inherited the egg-laying ability of their mothers. Following the results of this work poultry breeders began to look for a cause, and the general tendency was to ascribe the failure of the "mass selection" method to lack of constitutional vigor. Notwithstanding the fact that heavy laying may be a more or less common character, it was found that the vitality of 200-egg hens was so materially affected that, in the majority of cases, they were not able to produce daughters possessing normal vigor. Also it was found that the daughters of 200-egg hens were usually poor layers. It was supposed, therefore, that a 200-egg hen was an abnormal producer. In a certain sense this is true, for more advanced work in poultry breeding has established the fact that heavy egg production is not inherited from the dam but is inherited from the sire. A heavy egg layer is one which has a good egg record for the entire year but which lays at least 30 eggs during the winter months, that is, during the winter season, from the 1st of October to the 1st of March. Any hen which does not produce 30 eggs during that time is classified as an average or a poor producer. Practically all breeding work is based on the selection of breeders from the standpoint of their winter production. This factor is of economic importance because we find that winter egg production is the most profitable phase of our poultry industry and it should be the aim of every one who is keeping fowls to secure the largest possible winter production

In brief, the results of the more advanced work in breeding for increased egg production show the following facts:—

That heavy egg-laying ability may be inherited by daughters from their sire regardless of the egg-laying qualities of the dam. This is shown in the results obtained in breeding the same sire to different dams, the result being that many daughters of the poor laying dams make good layers as well as do many daughters of the good laying dams. That is, the proportion of daughters which inherit heavy egg-laying ability is dependent upon the sire.

In the second place it was shown that heavy egg-laying ability is not inherited by daughters from their dam. This is shown from the fact that continued selection of heavy laying dams does not affect in any way the heavy egg production of the daughters. Moreover, the production of heavy laying daughters is the same whether the dam is high or of low egg-laying ability, providing both are mated to the same male. This is equivalent to proving the influence of the sire in increased egg production.

Lastly, the daughters of a heavy laying dam may show either high or low egg-laying ability depending upon their sire.

The results of these experiments conducted in breeding poultry have been of immense benefit as well as great interest. Briefly, these results may be explained from the fact that heavy egg production follows a different course of inheritance from average egg production. The inheritance of egg-laying ability depends upon three factors:—A hen must have a normal ovary, else she cannot produce eggs. Having a normal ovary she must first possess the factor of normal egg production, that is, she must be able to lay approximately 150 to 180 eggs in the year, although she may lay comparatively few of them during the winter months. The third factor entering into the inheritance of egg-laying ability is the factor for excess egg production. This factor simply means that the hen must lay 30 or more eggs during the winter season, as intimated previously. Now the factor for normal egg production is inherited in the ordinary Mendelian fashion, that is, a pullet may inherit the normal egg-laying factor from either the dam or the sire or both. If she possesses this factor inherited from either or both parents she will be a normal layer. On the other hand, the factor for excess egg production is inherited in a different way than the factor for normal egg production. The results of breeding experiments in many different lines have shown that sex is an inherent quality, and, moreover, it was found that the factor for excess egg production is sex limited and is born by the male bird only. Therefore, in breeding for heavy egg production in pullets, male birds must be used which posses the excess egg-production factor. That is why so much attention is now given to the proper selection of cockerels in breeding work. Breeders now assume that the greatest improvement can come only through the selection of bred-to-lay cockerels. At the same time, however, sufficient attention must be given to the female side of the breeding stock to insure the maintenance of constitutional vigor and vitality.

The interpretation of these results may be slightly beyond the grasp of the average poultryman and farmer, and doubtless a few suggestions can be made which will be of considerable value. It should first be stated that great attention should be paid to constitutional vigor and vitality, for in the long run egg production largely depends upon the health of the hen. If one is to obtain the best results no bird should be used as a breeder which has ever been ill. In the second place careful observation of the flock from day to day should enable one to select the best producers among the females in order that they may be used as breeders to obtain suitable cockerels for breeding purposes. It is not practicable for the average farmer or poultryman to practice trap-nesting but one should be able to make considerable improvement through the study of his fowls. It might also be suggested that too much out-breeding should not be done as the securing of new stock from different parties from year to year is liable to affect the egg-laying quality of the present strain.

M. A. JULL

POULTRY HOUSE PRINTS

THERE are available for distribution to the people of Quebec Province a number of blue prints showing plans and specifications for the construction of different styles of poultry houses. The houses include the Tolman, the Macdonald and the Shed Roof types, and applications for blue prints should be made to the Poultry Department, Macdonald College, Que.

THE IMPORTANCE OF THE REMOVAL OF MALE BIRDS AFTER THE BREEDING SEASON

By W. A. Brown and J. H. Hare

Eggs which have been fertilized constitute the greatest proportion of the inferior stock which, when examined, proves unfit for food. It is not necessary that these shall have remained for a time under a broody hen, a temperature of seventy degrees being, in itself, sufficient to cause the germ to commence to grow. If the heat is constant the development of the chick will continue, but if it ceases or is intermittent, putrefaction at once sets in and the egg becomes bad. On the other hand infertile eggs which are free from the active germ cell, do not, under ordinary conditions, deteriorate seriously.

Few farmers seem to realize these facts, and consequently very few make any effort to insure infertility. The impression prevails among many that the presence of the male bird in the flock is essential to the production of a maximum number of eggs. This assumption has been proven, time and time again, to be absolutely without foundation.

Farmers and others selling eggs for market are recommended to kill off or dispose of the male birds after the breeding season. As a result of their remaining with the flock after June 1st, Canadian farmers lose each year at least a million dollars, through the presence of partially incubated eggs in

WOMAN'S WORLD

HOMEMAKERS CLUB AT CANTERBURY

On June 9th a Homemakers Club was formed at Canterbury. Miss Campbell was present, and explained the nature of the work and assisted in organizing. The officers for the coming year. are: Mrs. Ed. Gordin. Pres; Mrs. Finlay Bennett, Vice Pres. Mrs. Wm. Mayhew, Secy. Treas.

HOMEMAKERS' CLUB AT EARDLEY

A meeting of the ladies of Eardley was held in the school house on May 30th for the purpose of discussing the advisability of forming a Quebec Homemakers Club. Rev. J. Armitage presided. Miss. Campbell, Macdonald College, was present and addressed the meeting. At its close the ladies decided to organize. The following officers were appointed: President, Mrs. A. Maclean; Vice-Pres. Mrs. McKibbon; Sec'y Treas, Miss. E. Murrayfield. This is the second club formed in Ottawa County.

WATERLOO WOMAN'S CLUB

A most interesting and instructive address was given by Miss Campbell of Macdonald College in the town hall on Tuesday, May 19th, under the auspices of the Woman's Club of Waterloo, Quebec.

When Miss Campbell helped to organize this club last January her time was too short to give anything but a brief outline of the work and its aims, and she graciously acceded to a request from the members to come and give a history of the Club, its work, purpose and outlook. She was listened to with the greatest interest.

Touching on club work, the different organizations and their particular line of work, she said, "we have our cultural societies, our philanthropical societies and temperance societies, but if culture, self-control and love of mankind are not inculcated in the home, societies, no matter how faithful to their ideals, can never reach the goal they seek".

Reform clubs and housewives' leagues are but one form of the "Homemakers' Club" in which, being a social and co-operative society, all the members unite for the good of home and country. The countryside as well as the town must benefit by this work, and since hearing Miss Campbell's talk the members are eager to see new clubs springing into existence all over the county. No woman can afford to let an opportunity go by that will aid her in the great task assigned to her—the making of successful men and women.

We shall always be grateful to Miss Campbell for having chosen Waterloo as one of the fields for her great work.

Margaret P. Keenan, Sec.—Treas.

Homemakers' Club,
Waterloo, Que.

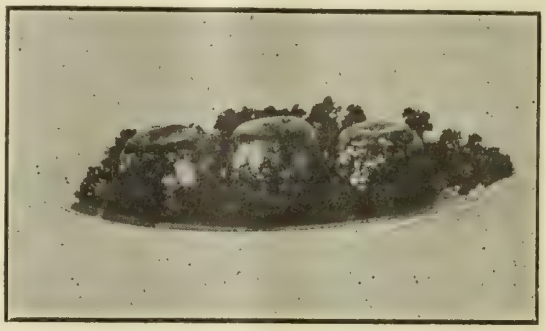
FOODS AND FOOD PREPARATION

Lesson VI

SALADS.

"Herbs, and other country messes
"Which the neat-handed Phyllis dresses."

The salad is a very ancient dish The Egyptians ate salad, and Virgil sang of it. The making of salad is an art, the study of which well repays the housekeeper. In the olden days when fingers were used instead of forks, the salads were always mixed by the prettiest and youngest woman present, and to say of a woman "She can mix the salad with her fingers" meant that she was still young and fair.



Individual moulds, jellied, of Waldorf salad, decorated with pimento.

The craving of the appetite in the spring and summer for fresh, crisp, uncooked vegetables is a healthy demand of nature and the palatable and attractive salad is a splendid means of supplying the body with important mineral matter.

Types of Salads

1. Uncooked vegetables—celery, tomatoes, etc.
2. Cooked vegetables--potatoes, asparagus, etc.
3. Combinations of above.
4. Fruit salads.
5. Combination of vegetable and fruit.
6. Meat Salads.
7. Fish Salads.
8. Jellied Salads.

Preparation of Salads

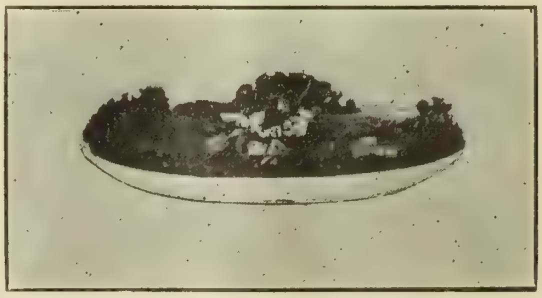
A. Uncooked Vegetables such as Lettuce, Parsley, etc.
  1. Wash each sprig or leaf *carefully*.
  2. Let it lie for a few minutes in cold water to crisp.
  3. Dry between folds of a clean towel and keep in an air-tight container until needed.

B. Raw Vegetables and Fruits, such as Cabbage, Apple, etc.
  1. Wash thoroughly and cut into suitable pieces.
  2. Crisp in water and drain well in a strainer.

C. Cooked Vegetables.
  Cut in suitable pieces — one-half inch dice. Do not chop finely.

D. Meat Salads, such as Veal, Chicken or Tongue.
  1. Cut in one-half inch pieces. Free from skin and gristle. Season.
  2. Mix with such vegetables as celery or cabbage.

E. Fish Salads.
  1. Divide in pieces large enough for an individual serving.
  2. Do not mix with salad dressing. Serve separately or pour it over the fish.
  3. Season with lemon juice, salt and pepper.



Asparagus salad garnished with lettuce and decorated with a band of hard-cooked egg, pickle, etc.

Mixing and Serving

1. Have everything very cold.
2. Combine only flavours that blend.
3. Do not mince the material finely.
4. Mix with two silver or wooden forks, being careful not to break pieces.
5. Never mix lettuce with a salad dressing. When French dressing is used the mixing is done at table just before serving. (See recipe for French dressing).
6. Garnish simply.
7. Parsley, lettuce, slices of hard-cooked egg, pimentoes, olives, slices of ripe tomato, sections of orange, nuts, etc. may be used for garnishing according to the character of the mixture.
8. All cooked vegetables *should be mixed* with the dressing *one hour* before serving.

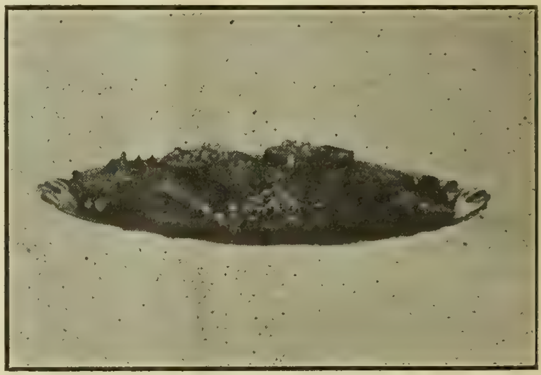
Salad Dressings

The excellence of the salad depends not a little upon the dressing, and care should be taken to use good materials and to combine them properly.

French Dressing.
½ cup Olive Oil.
2 tblsp. Vinegar.
1 teasp. Salt.
Pinch of Cayenne.
1 tblsp. Lemon. (If wished)

Mix ingredients and stir until well blended.

When this dressing is applied to lettuce or any fresh vegetable, the mass should be turned gently over and over, steadily and evenly, so that every portion of the vegetable is imbued with the mixture, and no drop of dressing left at the bottom of the bowl.



Sliced tomatoes sprinkled with hard-cooked egg powdered finely.

Cooked dressings.

1. 2 eggs.
¼ cup vinegar (white wine).
¼ cup water.
½ tsp. salt.
½ tsp. mustard.
1½ tbsp. sugar.
2 tbsp. butter.
½ cup whipped cream folded in when cold.

Mix dry ingredients. Stir in vinegar and water to dry ingredients and beat. Beat eggs slightly in a bowl and beat the mixture slowly into them. Stand the bowl in a pan of boiling water and beat until the mixture coats the spoon. Remove *at once* and add butter. When cool fold in the cream.

Note:—This dressing will keep three weeks in a cool place, provided the cream is not added until used.

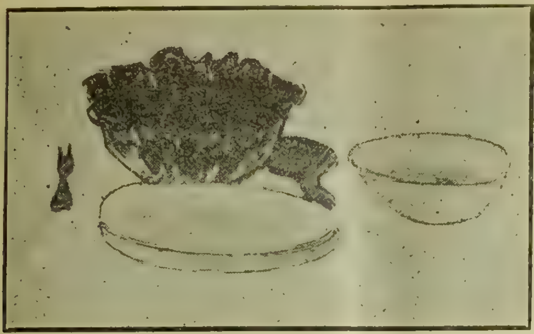
2. This is a very easily made dressing and very popular with the busy housekeeper. If kept covered in a cool place it will keep very well for two weeks.

2 egg yolks.
1 tsp. salt.
1 tsp. mustard.
1½ tbsp. sugar.
½ tbsp. flour.
1½ tbsp. melted butter.
¼ cup vinegar.
¾ cup milk.

Mix dry ingredients, add eggs beaten a little; then, the butter, milk and vinegar. Cook in a

---

the produce which is marketed. The fact that the best trade in many cities in Canada now offers the premium of from one to five cents per dozen, for non-fertilized eggs, suggests an additional financial consideration which but few can afford to overlook.



The salad bowl arranged for the table. Dressing served separately.

double boiler stirring constantly until it thickens. Remove *at once*. (If overcooked the dressing will curdle).

Mayonnaise dressing.

This is the most difficult of all the dressings but is well worth the trouble involved.

¾ cup olive oil.
1 egg yolk.
½ tsp. mustard.
Few grains cayenne.
½ tsp. salt.
1 tsp. powdered sugar.
1 tbsp. lemon juice.
1 tbsp. vinegar.

Be sure that ingredients are ice cold and place the mixing bowl on the ice. Have the freshest of fresh eggs. Beat the egg yolk and add to dry ingredients. Add ½ tsp. vinegar and mix. Add oil drop by drop, beating with dover beater. As mixture thickens, thin with the remaining lemon juice and vinegar. The last half of the oil may be added a little more quickly. The mayonnaise should be stiff enough to hold its shape. Set on ice.

Tomato Jelly Salad

To one quart can of stewed and strained tomatoes, add one teaspoon each of salt and powdered sugar, 2½ tbsp. gelatin which has been softened for fifteen minutes in ½ cup cold water. Stir the gelatin in the juice over the fire until it is all dissolved. Pour into small cups and chill. Serve on lettuce leaves.

Note:—If desired a few pepper corns, half a bay leaf and a clove may be cooked with the tomato.

The above is a good way to use canned tomatoes but fresh tomatoes ought simply to be served sliced, or, if very small, whole. Be sure to *skin* tomatoes before slicing. If they are dipped in boiling water for a *second* they will peel easily. Serve very cold.

Jellied Waldorf Salad

1 head celery.
1 apple.
¼ cup walnuts.
¼ cup lemon juice.
1 tsp. vinegar.
1 tbsp. gelatin.
½ cup orange juice.
¼ cup boiled water.
¼ cup sugar.

Soften the gelatin in 4 tbsp. cold water for 15 minutes. Heat the liquids and simmer for three minutes. Add the gelatin and stir until dissolved. Cool. Fill the moulds 2-3rds full of solid ingredients and add enough liquid to cover.

Other combinations may be jellied and served in this way. Some combinations for vegetable salads:

1. Beet and apple.
2. Beet and celery.
3. Cabbage, apple and celery.

Asparagus Salad

Cook asparagus, chill thoroughly and arrange on a bed of crisp lettuce leaves. To the white of one hard-boiled egg finely chopped, add one tablespoon each of chopped pickle and pimento and one-half tablespoon finely chopped parsley. Tomato may be used instead of pimento. Arrange as in illustration. Serve with French Mayonnaise or dressing.

Lettuce Potato Salad

Shred lettuce very fine and set in a cool place. Peel and cut raw potatoes into dice-shaped bits and cook with an onion. When done, remove the onion. Pour over the potatoes while still hot, a French or a cooked dressing. When the potato becomes very cold and the dressing is well absorbed, add the lettuce before serving. Sections of cold boiled egg are a suitable garnish for this salad.

If the potatoes are "left-overs" add a little onion juice to give a flavour, but be very careful.

F. CAMPBELL

THE CHILDREN'S HOMER

IV.

ZEUS, after he had promised Thetis to help the Trojans, while Achilles would not fight, called a false Dream to him, and said,

"Go, false Dream, to the swift ships of the Greeks, to the couch of Agamemnon, and tell him all I bid you. Command him to arm the Greeks with all haste, that now he may capture the city of Troy with its broad streets. For at last Heara has given in, and will yield up Troy to its destruction".

The Dream obeyed;-taking the shape of Nestor, tne wisest old kind among Agamemnon's friends, he stood at the head of the king's bed, and said,

"Are you asleep, Agamemnon ? It is not right that a man who has charge of all the people should sleep all night. Now give heed to me, for I am a messenger from Zeus to you". And the Dream told Agamemnon what Zeus had said.

Then Agamemnon awoke, half doubting, half believing what he had heard in his sleep; but rose and called a council of the kings before dawn, and, when he had told them, Nestor said the king's dream must be obeyed.

All the people were called to an assembly at once and Agamemnon made a trial of them to see what they would do. He told them that he had given up hope of taking Troy, and, disgraceful as it was to fail after all this struggle, and when the Greeks were more numerous than the Trojans, yet he was weary and homesick and now it was better to give up and go home. He hoped the people would refuse, but they were only too eager to go, and rushed off at once to their ships. That might have been the end of it all, but the goddess Athena, hurrying to Odysseus bade him stop the people.

Odysseus was the cleverest speaker among the Greeks, and knew just how to make the people wait and listen to him; so that at last he made them all return to the assembly, and be quiet, except one rough and noisy man named Thersites. He was the ugliest man that came to Troy, and the meanest; he hated Odysseus, and began to rail against him, urging the Greeks still to go home, to fight no more for a selfish king like Agamemnon, who had treated Achilles so unjustly.

Odysseus struck him with his sceptre, bidding him be silent, and at that Thersites cowered down, crying, while all the Greeks laughed at him. Then Odysseus spoke to them of the shame it would be to go home defeated, without Helen, or the stolen treasure; of the signs and prophecies there had been that they would surely succeed in the tenth year; and of the pity it would be, to have fought so long, and yet not the little longer that would win them the victory.

Wise old Nestor urged the king to marshal the army by tribes, and lead them on against Troy, but Agamemnon told the people they would feast first, because hungry men would not fight well. So all the host prepared their feast, and Agamemnon sacrificed an ox, and prayed to Zeus to fulfil his dream.

Then the tribes assembled, spreading out in their shining armor like a fire in a forest that throws its light up to the sky. And the sound they made echoed like the cries of great flocks of cranes flying over the meadows.

Thus the Greeks gathered for battle from their ships, and Homer tells all their tribes and their kings, a long list, interesting to Homer's hearers because they knew them so well, and because many of them traced their families down from these kings, but not very interesting to us.

The Trojans came out from their city to meet the advance of the Greeks, shouting and making a great clangor with their weapons. The Greeks went forward in silence, fierce and wrathful, and a cloud of dust rose up from beneath their swift feet.

But before the battle could begin, Paris came out in front of the Trojans and offered to fight any Greek in single combat. When Menelaos, however, rushed forward, eager to meet him, Paris shrank back, afraid, from the man he had so wronged.

Hector was ashamed to see his brother cowardly, and urged him not to flee, but to prove his courage. Paris finally declared he was willing to fight Menelaos, and settle it so, which should have Helen and her wealth. To this Menelaos and the Greeks agreed and old King Priam was sent for, to come out and ratify the compact.

While all this was happening, Iris, the goddess of the rainbow, and messenger from Heaven to earth, went to Helen and told her about it. Then Helen, with her maidens, went out through the city street to the Scaean gates, where, upon the high towers, the old counsellors of Troy were sitting to watch the conflict. When these old men saw Helen, they said to one another,

"No wonder that the Greeks and Trojans both will suffer all this time for such a woman,—for she is fair as any goddess! But fair as she is,—let her go away upon their ships and not leave sorrow to us, and to our children".

Priam asked Helen to come sit by him and point out the bravest of the Greeks, which Helen did,—Agamemnon first, and Odysseus, and the mighty Ajax. She looked for her two brothers, Castor and Pollux, not knowing that they had died long since in Sparta.

Then the heralds came to get Priam and he went out to the plain, where the two kings agreed upon the combat between Paris and Menelaos, and offered a sacrifice to Zeus.

While Hector and Odysseus measured off the lists where the fight should take place, the people sat down in long rows, each with his arms and horse beside him. The champions armed themselves, and strode out into the lists. Paris threw his javelin first, but it glanced from the shield of Menelaos, without harming him. Then Menelaos threw his, with such force that it pierced the armor Paris wore and wounded him, and Menelaos seized him as he fell, by the plumes of his helmet, thinking to drag him among the Greeks. The cord that held the helmet under Paris's chin broke, luckily for him, and Menelaos, throwing the empty helmet to his people, turned again,—but Paris had disappeared. The goddess Aphrodite, who always defended him, had hidden him in a cloud of mist, and carried him back safe to his chamber in his palace in Troy.

Neither Greek nor Trojan could find where Paris was, and Agamemnon claimed that, as Menelaos had won, the Trojans must give up Helen and the treasure, according to their agreement.

This, but for the gods, the Trojans might have done, for they hated and despised Paris; but the gods were in a council to watch the conflict, and Zeus now proposed that they should finally make up their minds wheher Troy should be saved or not. So, while Hebe, the lovely cup-bearer of the gods, passed the nectar which the gods drink, they disputed, and in the end Zeus promised Hera and Athena that Troy should be destroyed.

Athena, going among the Trojan soldiers, urged Pandaros, a treacherous Lycian, to shoot at Menelaos with his bow. He, thinking that Paris would reward him for such a deed, shot and wounded Menelaos, which broke the truce between the armies and fighting began at once all over the field.

The Greeks got the better of it for some time, their heroes, Odysseus, and Ajax, and Diomede, slaying many Trojans. The treacherous Pandaros was killed by Diomede, as he deserved. Even Aphrodite, when she came to aid Aeneas, who was her

OF GENERAL INTEREST

THE VALUE OF A PURE-BRED SIRE

By Wilber J. Frazer, Chief of Dairy Husbandry, University of Illinois

A few poor cows may do little permanent harm to the dairy herd but a poor sire will do untold damage. Frequently dairymen hold the penny so close to the eye it is impossible to see the dollar a little farther off, and this is just what a man is doing who has a good dairy herd of grade cows and thinks he is economizing by buying a poor or even common sire.

If the good pure-bred sire improves the milking capacity of his daughters only one and one-half pounds of milk at a milking, above the production of their dams, this would mean an increase of 900 pounds of milk for the ten months or 300 days an ordinary cow should give milk. The daughter would also be a much more persistent milker, that is, would give milk for a longer time in the year, and she would regain her flow of milk better after an unavoidable shortage of feed, as in a summer drought. These daughters may certainly be credited with 1,000 pounds more milk per year than their dams produced. At the low estimate of $1 per 100 pounds this extra amount of milk would be worth $10 per year. The average cow is a good producer for at least six years, or until she is eight years old. It will on the average be four years after purchasing the sire before his first daughters will have brought in the first extra $10. Eight dollars and twenty-three cents kept at compound interest for these four years at 5 per cent will equal $10, so the daughter's improvement or increase of income the first year is worth $8.23 at the time her sire is purchased. The cash value of the daughter's improvement (inherited from the sire) figured in the same way for each of the last six years she gives milk is shown in the following table:

Improvement first year	$8.23
Improvement second year	7.83
Improvement third year	7.46
Improvement fourth year	7.11
Improvement fifth year	6.77
Improvement sixth year	6.45
Improvement for six years	$43.85

The total increased income of a cow over her dam by having a good sire is therefore $43.85.

In an ordinary dairy herd of thirty-five to forty cows an average of seventeen heifers per year should be obtained, and twelve of these should be worth raising, making it easily possible for a bull to earn twelve times $43.85, or $526 per year. This would amount to $1,578 in the three years that a bull is ordinarily kept in service.

Cost of providing every heifer one good parent:

	Purebred	Scrub
Cost of sire	$150.00	$ 30.00
Interest, 3 years 5 p. c. . . .	22.50	4.50
Cost of keeping, 3 yrs . . .	100.00	100.00
Risk, 3 years	50.00	10.00
Total expense, 3 yrs	$322.50	$144.50
Value at end of 3 yrs . . .	100.00	30.00
	$222.50	$114.50
	$114.50	

Extra cost good sire, 3 years	$108.00
Extra cost good sire, 1 year.	36.00
Extra cost good sire, 1 daughter	3.00

Considering the male calves as worth no more than if sired by a scrub, it would then cost $36 to provide one good pure-bred parent for the twelve heifer calves which are raised each year, or $3 per heifer. Where else can such an investment be found? Three dollars expended brings in an average return of over $7 per year for six years, or $43.85 in all. This makes a clear addition of $43.85 to the income of each daughter, or a net profit of $40.85 and of $1,470 for thirty-six daughters in the three years. Here is nearly 1,000 per cent profit on the investment. The original cost of the good sire looks very small beside the $1,470. It really pays, as nothing else on the farm pays, to put $150 into the right kind of a dairy sire that will return practically ten times $150 within three years.

An examination of details will show these estimates to be conservative. There is plenty of margin left for failures and unfavorable conditions. One thousand pounds of milk per year is a conservative estimate of the improvement of the daughter's production to credit to a good sire, but the details of figuring it may be varied to suit conditions in different herds and different localities. One hundred and fifty dollars is certainly a liberal allowance for the purchase of a pure-bred sire, and results here named are based upon having a first-class animal at the head of the herd. A herd of only thirty-five or forty cows is taken for illustration, while a vigorous sire properly fed and exercised is sufficient for a herd of forty-five to fifty cows, provided he is not allowed to run with them. There is another distinct improvement of the good sire's daughter besides her milk production: it is the improvement of her blood or breeding, as the result of which her daughters will be better milk producers. This blood improvement of all the daughters accumulated through a series of years means a remarkable increase in the efficiency of the herd.

It is the common experience of all dairymen who have used a really good improved dairy sire that the investment has made them royal returns. The $150 cost price looks "too big" only to the narrow vision that cannot see the natural improvement of the herd certain to follow. Many a dairyman might have reason to say that he cannot afford to pay a big price for a fine cow, but the same argument does not apply at all to the purchase of an improved bull, because the sire's influence spreads so much farther and faster than that of the cow.

If the heifer calves are to be raised for dairy cows there is absolutely no business reason on earth for keeping a scrub bull. The dairymen who think there is pay a heavy price annually for maintaining that tradition. The scrub bull is the most expensive and extravagant piece of cattle flesh on the farm. He does not stop at being merely worthless, but will lose the farmer the price of two or three good bulls every year he is kept. The dairyman could not afford to keep a scrub bull if the animal were given to him, if he were paid for boarding the beast and given a premium of $100 per year for using him. The presence of the scrub in so many dairy herds — many times without a single qualification except that he is a male—is an offence and disgrace to the dairy business and a plain advertisement of the dairyman's thoughtless bid for failure. The only thing on earth the scrub sire is good for is sausage, and it is high time that this plain and simple truth were given practical acceptance on every dairy farm.

By all means get a good dairy sire if you have to sell two or three cows to do it. The improved sire is, without question, the most economical investment in any dairy herd.

---

son, and one of the noblest of the Trojans, was pursued and wounded, although, being a goddess, she could not be killed. But Apollo came to the rescue, and saved both her and Aeneas.

After a while, however, Hector rallied the Trojans, and with the help of Ares the god of war, who loved him for his bravery, drove the Greeks slowly back toward their ships.

MARGARET GRAY

THE CO-OPERATIVE MOVEMENT IN DENMARK

(Continued from our March number.)

CONTROL SOCIETIES

THE object of these societies is, amongst other matters, to report the quantity of butter fat contained in the milk, and to keep a complete record, not only of the entire stock, but of each single cow, and control the milking capacities of the cows. In 1895 the first control society was formed, and by 1911 there were 521. The general milking capacity per cow in the control societies, taken for the entire country, was 5,756 lbs. (Danish milk is usually reckoned by weight), whilst the corresponding figure for cows outside the control societies was 5,120 lbs. The difference was therefore 600 lbs. of milk, corresponding to about 23 lbs. of butter annually, so that the controlled cows gave about one-eighth more milk than those not under the control. In this form of the co-operative movement the principal participants are the proprietors of medium-sized and large farms.

CO-OPERATIVE BACON FACTORIES

The first co-operative bacon factories were founded in 1887. There are 42 now working, and more are being started. The foundation and working capital is about £550,000. The co-operative bacon factories have 120,000 members, and in 1911 1,695,843 pigs were slaughtered, representing a value of £5,900,000. Besides this certain of these bacon factories slaughtered cattle to the number of 28,000 last year, representing a value of £150,000. Furthermore, there are some which also have a department for exporting eggs; this export rose last year to the value of £162,268. The capital for starting the various Danish co-operative enterprises is raised by means of loans, which the members guarantee. This guarantee usually covers a period of 10 years, at the expiration of which time the liabilities are paid off, or at least have been brought down to so small a sum that the buildings with plant, &c., in any case represent a value amply sufficient to cover the remaining debt, should the members wish to withdraw. The co-operative members' obligation with reference to the number of pigs they are to supply, vary with the different bacon factories according to the manner in which the regulations are framed. To some bacon factories the member must deliver a certain number of pigs agreed upon, whilst to others he is obliged only to send those he has suitable for bacon. The co-operative bacon factories fix every week a certain price, according to which the members get paid out in advance a certain sum, dependent on which class (first, second or third) the pig is judged to belong to. At the end of the financial year, after all expenses have been deducted from the assets, the accounts are brought forward at a general meeting, and it is decided what sum can be paid out, or what should be paid back on the money advanced. At this general meeting every co-operative member has the right to one vote, and all matters that would not necessitate a change in the regulations and laws are simply decided by a majority of votes.

Every pig killed in Denmark for export is inspected by a veterinary surgeon, appointed by the State, and under the control of the Department for Agriculture. Every pig in which the smallest sign of tuberculosis can be traced is kept back from being exported as bacon. Those pigs suitable for export are branded with a mark in *red* colour, and this mark guarantees that the bacon is derived from completely sound animals. The co-operative bacon factories have themselves requested the Department for Agriculture to introduce these strict control regulations in order thus to guarantee their customers in the United Kingdom the soundness of their produce. The same control is maintained in all factories, including the private ones, and the same mark is applied to all Danish bacon.

With the help of breeding stations, which are under the control of the Department of Agriculture, the producers are continually endeavouring to improve the quality of the bacon, and to meet the requirements of the consumers in the United Kingdom.

CO-OPERATIVE EGG EXPORT

This branch of the co-operative movement first began to develop in 1895, when a Danish co-operative egg export society was founded. It started local centres of which there are now 500, introducing the branding system, and the strict regulations requiring members to deliver only clean new-laid eggs for export. Danish eggs are now an excellent article of sale, equal to both the butter and the bacon in this respect.

Before the eggs are packed for export, they are submitted to examination by electric light, in order to ascertain their freshness.

That agriculture is Denmark's most important industry can best be seen by recent statistics, which indicate that 88 per cent of the country's export is agricultural produce.' Denmark annually exports butter, bacon, eggs and meat to the value of 450,000,000 kr. (£25,000,000). It is principally during the last 20 to 25 years that so enormous a development has taken place. A cause of this growth is the fact that the laws all tend to prevent the creation of new large farms, as it is forbidden to join smaller farms and thus make large farms out of them, and also that a large proportion of the land leased to, or worked by the peasants, which 50 to 60 years ago belonged to the large estates, has been sold to them, so that the Danish peasant himself owns the land he cultivates; it is estimated that only one-fifteenth of the agricultural population are tenants or lease-holders, the remaining peasant farmers being freeholders.

It may also be remarked that the successful results obtained by Danish agriculture of recent years, are in a great measure to be attributed to the system prevailing at the Danish Government and State-aided schools, at which special attention is given to educating the pupils of both sexes for practical farming life.

Denmark's population was in February, 1911, 2,757,076, of which number 34.5 per cent belonged to the agricultural classes. Of large estates or gentlemen's farms there are 2,066, of peasants, farms 75,520, and of small holdings, 74,000.

(Trade & Commerce Report)

THE ORIGIN AND DISTRIBUTION OF WHEAT

It is impossible to ascertain definitely the geographical origin of wheat. It seems to have been a food for man since the beginning of history and to have developed as man has developed. Evidence points to the Valley of Mesopotamia, the cradle of civilization, as the birthplace of wheat, and from this center it is supposed to have spread to Phoenicia and to Egypt. The Chinese considered it a gift from heaven, and the Egyptian attributed its discovery to Isis. The most ancient languages mention it; it is found among the relics of the ancient Swiss lake dwellers; it was cultivated in China 3,000 years ago, and it was a chief crop among the ancient Hebrews.

It has been said before that all the cereals sprang from a kind of wild grass. Wheat, therefore, is related to all the other cereals, but in importance it has out-classed them all.

Wheat was not grown in the new world until after Columbus's discovery. Maize, or Indian corn, was the chief food of the Indians. It is said that a negro slave of Cortez found three or four grains of wheat in the rice which served as a food for the Spanish army. These were sown and thus wheat was introduced into Mexico. The first wheat sown in the United States was by Gosnold, in 1602, on the Elizabeth Islands, off the southern coast of Massachusetts. It was first cultivated in Virginia in 1611, and in the present State of New York in 1622.

It is easy to see that the migration of wheat has been closely connected with the migration of peoples. It is the one cereal that civilized people carry with them, and wherever they make their homes they quickly develop a variety that can be cultivated. This was especially true before the days of the railroad and the steamboat, when it was difficult to transport foods any great distance overland.

It is not as important, commercially, in America as Indian corn and does not adapt itself to new lands and changes in environment so rapidly. Corn was the main support of the early colonists and the pioneers, but wheat has followed the westward migration of population, and the center of wheat production to-day is in the Middle West.

Wheat is more widely cultivated than any other cereal. It is cultivated from the Arctic almost to the Antarctic circle and in every longitude of the globe, and there is not a month in the year that some nation is not harvesting it. It is interesting to observe when wheat is harvested in different countries:

January—Australia, New Zealand, Chile.
February and March—Upper Egypt and India.
April—Lower Egypt, India, Syria, Cyprus, Persia, Asia-Minor, Mexico, Cuba.
May—Texas, Central Asia, and northern Africa.
June—Southern and trans-Rocky Mountain States of America, Turkey, Greece, Italy, Spain, Portugal.
July—New England, Middle Atlantic and Northwestern States of America, Upper Canada, Roumania, Bulgaria, Austria, Hungary, Southern Russia, Germany, Switzerland, Southern England.
August—The far northwestern States of America, parts of Canada, Belgium, Holland, Great Britain, Denmark, Poland, central Russia.
September and October—Scotland, Norway, northern Russia.
November—Peru, South Africa, northern Argentina.
December—Argentina, Burmah, New South Wales.

It will thus be seen that, since wheat is cultivated in so many different latitudes and altitudes, there must be a great number of varieties, and this is true.

Bulletin U. S. Bureau of Education.

POSSIBILITIES OF A MODERN MAPLE GROVE

By Dr. George Fisk, Montreal, Proprietor of Maple Glen Reserve, Magog, Quebec

(From Canadian Forestry Journal, Jan. 1914)

The Canadian Forestry Association is authority for the statement that 50% of the land in the Dominion of Canada is fit only for growing tree crops. The many deserted farms in the outlying districts of the Province of Quebec tend to confirm this opinion, for if we investigate why these farms have been deserted, we learn that as soon as the lumbermen had cropped the neighboring lands of the best lumber, the outlying farmers found it difficult to make a living from handling crops without the aid of the tree crops. A move to a new farm in an unlumbered district provided him with profitable work for the whole year. These farms that have been deserted in this way have soon grown up to a second growth, principally of the hardwood varieties, and in many cases with a very large percentage, if not a pure growth of maple. It would appear, then, if lumbering was at one time profitable, and the annual crops were not sufficiently profitable to retain the farmer, that the question of reforesting these farms warrants very careful consideration.

In districts of sandy soil the pine tree is the favorite for replanting, and should be a commercial success. However, the investor could not hope to realize a return on the investment in less than sixty years, the average time required for a pine tree to grow to a diameter of 18 inches. This proposition is hardly attractive to the farmer who must of necessity count on an early return from his investment. The only natural forest tree in Canada which may be cropped while it is slowly growing to maturity for lumber is the maple tree. This may be tapped with profit for the production of maple sugar after it has grown to the size of six or eight inches, and so provide a revenue long before it is large enough to give the best returns as lumber. In twenty-five or thirty years after a tree the size of a broom handle has been transplanted, it should yield a very profitable return for the time and money invested.

The most suitable locations in the Province of Quebec for maple groves are along the ridges and hillsides, and it is not difficult to find many hillsides gradually sloping, which have been cleared or partially cleared, and are now grown up to thickets of hardwood in which maple largely predominates. Mr. R. H. Campbell, Director of the Forestry Branch of the Department of the Interior, concludes an interesting comparison between the pine tree and the maple tree as follows 'When one considers the revenue derived after the thirtieth year from the sap, and the higher prices obtainable for thinnings as fuel, or making acetic acid, wood alcohol and charcoal, there seems but little doubt that the maple would in the end be the more profitable tree. This is particularly true in the case of the small wood-lot owner, or farmer, who has many uses for the wood, and especially where the maple already exists in the stand and natural reproduction can be secured.'

Let us examine this problem of a maple orchard, ideal in location, arrangement and outfit for producing maple sugar of the highest quality at the lowest possible cost. To produce an article economically is, of course, to produce it in fairly large quantities. It is, therefore, probably wise to develop as large an area as possible in one sugar orchard. The chief expense in administering a sugar orchard is in gathering the sap from tree to tree. The quickest and most economical method of doing this is by gravity through a system of pipe lines. The orchard preferably should be placed around a sloping hillside not too rough or steep for the necessary road where teaming is needed, and this entire slope should focus at some point lower down, where the sugar cabin and storage tanks should be placed.

It is not difficult to find in this province many suitable areas in which more than 30 or 40 acres of hillside are tributary to a suitable point for a sugar cabin. If we take, then, for illustration, a unit of thirty acres, sloping preferably to the east or southeast, we would in time be able, by proper planting, to have an orchard of 4,000 trees or more, estimating 133 trees per acre. This should mean 4,000 buckets or perhaps more, if some trees are large enough to permit of more than one bucket. If this area contains maple trees already, it simplifies the undertaking very much, as it will not be necessary for the owner to wait twenty-five years for the full maturity of his orchard. If the other varieties of wood are first cleared out, and the vacant places filled by planting young maples where necessary, the orchard will go on improving year by year.

In considering the economical administration, small subsidiary cabins should be built at convenient points to allow for the storage of tanks, covers, sprouts and piping, each cabin to contain from 500 to 1,000 buckets. This facilitates tapping in the early spring, when the snow is deep and the transportation is difficult. With a system of two-inch galvanized sheet iron pipe in 10 ft.

lengths, which can be placed in position on a series of posts, or suspended from a line of barb wire, so as to be easily taken up after the season is over, and stored in the cabin, all long hauling of sap is obviated. The collector of sap, with a neck yoke and two pails, gathers the sap from tree to tree, and empties it at pleasure into the nearest pipe by means of a connecting hopper. The sap flows direct to the storage tank, and the collector wastes no time in needless journeyings to the storage tank. With a complete line of piping, it is never necessary for a collector to travel more than a few yards before emptying his load. A good man should be able to gather all the sap from 600 to 800 trees each day in this way.

It is very important that the evaporating outfit should be ample for the size of the sugar orchard. We see all too frequently small evaporating accommodation necessitating much overtime work. The largest evaporator at the present time on the market is a 6 ft. x 24 ft. This is not at all unwieldly, and can be operated by one man with little more trouble than one of one-fourth the area. In most sugar orchards this size should be ample for an orchard of 4,000 trees, by providing a night shift for boiling. The next point is to provide large buckets, covers, and satisfactory spouts to give the best possible returns from each tree tapped. It is a frequent observation that small buckets waste one-half of the sap which flows, and that uncovered buckets in rainy weather waste nearly all the sap.

It has been estimated that about 9% of the sugar content of the maple tree is obtained from a single tapping. It is also an opinion of experts that if 20% could be obtained no damage would be done to the tree. If some way is devised by which an increased flow could be obtained it would increase the commercial returns materially.

In administering a sugar orchard it is a well-known fact that if the orchard is concentrated over a small area it is much more economical than where the trees are wide apart. Careful reforesting of the barren areas in the orchard will, in time, give an ideal orchard for economical administration.

There are many points in the cabin and woodshed which may be adjusted for economical administration. A large evaporator will frequently absorb three cords of wood during the day. This is a lot to bring in by the armful. An overhead rail from the woodshed with a truck suspending platform will simplify this very much. There are many other similar points of economy which we will not mention.

Let us estimate then, the results at the end of twenty-five years, after careful reforesting, that one would expect to obtain. With an area of thirty acres, averaging 135 trees, or 135 buckets to the acre, and one large evaporator, it would be possible for six men to administer this with comparative ease. The average annual return should be about two pounds of sugar per tree, or one gallon of syrup to five trees. If a high quality of sugar and syrup were made, as it should be under these conditions, a high price should be obtained for the product, at least $1.50 per gallon, for the syrup, and 15 cents a pound for the sugar, on an average. This should show a gross return of $1,200 per annum. Allowing an ample wage list of $300, the depreciation of plant of $100 (which is over generous), the net returns would be $800, or $20.66 per acre, which is a very good return for what is now waste land.

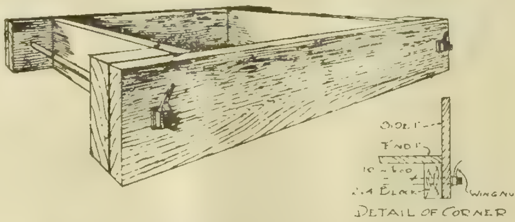
The labor problem, of course, is a very important factor in any estimate of this kind, but the sugar season is a quiet one with those who work on the farm and in the lumber woods, and with proper accommodation for the men, preferably in the sugar orchard itself, it should not be difficult to provide and retain adequate skilled labor. To many a farmer who has a wood lot and taps a few trees that nature has given him, the return is not large for the labor, but the same thing prevailed in the apple industry, when the farmer attempted to sell a few seedling apples from accidental fruit trees about the fences and clearings. To-day select orchard lands are planted, drained, cultivated, and carefully tended, and I am free to say that, considering the initial cost of suitable apple tree land, and the subsequent expense of planting and caring for the orchard, the return is not greater, nor the investment more secure, than in a maple orchard well located and well administered. Furthermore, much of the land suitable for maple trees is quite unsuitable for fruit trees, and young maple trees are found on every hand ready for planting, and require no spraying or cultivating. The necessary capital to plant a maple orchard is far below the amount required to plant a fruit orchard.

If our Government would wisely limit the use of the word "maple" to absolutely pure maple products, it would then be a perfectly safe commercial venture to reforest many of the waste areas, and develop those gorgeous maple groves which are at once the glory and salvation of our northern hillsides.

SIMPLE SIDEWALK CONSTRUCTION FOR THE FARM

THE following is a true description of the situation to be found on many prosperous farms: "A comfortable and well-built house, tastefully furnished. A wide porch affording protection from sun and rain. Substantial barn and outbuildings. Between these buildings run the pathways or walks used many times each day, but on hundreds of farms they are simply thoroughfares of mud during frequent periods but especially in the spring, when the frost is coming out. They are a false and discordant note in an otherwise attractive environment."

Now, the farmer who fails to establish good walks about his premises can no longer plead prohibitive cost or lack of time, and this is the season for him to remedy the situation. It is the purpose to set forth briefly a method of doing this at minimum outlay and by means so easy that it will seem like play to have a substantial walk from building to building, or from the house to the garden—something an intelligent boy of mechanical bent could accomplish.



A Simple and Convenient Board Form or Box for Casting Slabs

To put down a concrete walk, such as is common in towns and cities, involves more or less experience and requires time and money, though it would be a good investment if well done. Such walks are far cheaper in the end than any other continuous type equally satisfactory and durable. It so happens, however, that many farmers cannot conveniently undertake the construction of a long walk with the certainty that work will not be interrupted, and walks of this character should be a continuous operation if the most economical results are to be obtained. If the farmer can afford to employ an experienced contractor to do the work, well and good. If not, he should go about it in another way.

Some years ago a firm of enterprising young men engaged in general contracting in a Pennsylvania town of three or four thousand inhabitants. They noticed that all the little-used streets had board sidewalks. These were constantly rotting away or the ends of the boards would become loose and dangerous, warping with exposure and presenting an obstruction to pedestrians. Numerous complaints and frequent threats of suits for damages were filed with the Town Council at each meeting of that august body. Noting this the young contractors decided that a good opening for increased business was at hand. They did not interfere with the professional sidewalk makers. They simply began the manufacture of concrete slabs and made it a profitable business. A farmer can follow the same plan. The method would be to make a few shallow boxes, each about 3 feet long, 2 feet wide and 4 or 5 inches deep. Then make a concrete composed of 1 part Portland cement, 2 parts clean sand and 4 parts gravel or crushed stone, the stone not larger than ¾ inch. To make the concrete, first thoroughly mix the cement and sand in the dry state and then add the water. The stone should also be wet and the whole mass mixed together until of mushy consistency, a consistency that would be called "sloppy." Dump the concrete into the boxes to the depth of an inch or more, puddle and work it, and then on top of this first layer of concrete place common chicken wire cut to the size of the box. Then fill the box with concrete and just before the latter has taken its final set the surface may be broomed with a circular sweeping motion to give a texture that will prevent people from slipping. The concrete may be removed from the forms or boxes in 4 or 5 days and protected from sun, wind and freezing, as the case may be, and thereafter sprinkled daily for about a week. The result will be a fine slab of indestructible, artificial stone.

Modern sidewalk practice does not always include a drained sub-base, as many suppose, but on the contrary many sidewalks put down in the customary way have been successfully built by placing them directly on a compact earth surface. The farmer can lay slabs on a natural base where the soil is at all suitable. This plan means that he may make just as few or as many slabs as he has time to make, once he has procured the raw materials. He could soon fill a half-dozen 3-foot molds and thus have 18 feet of walk in the forms, which could be refilled the moment the first lot was removed, or at any convenient time. In brief, he would be making so much concrete lumber, which could be distributed quickly and easily, in fact in less time than would be required to put down a well-made boardwalk.

In making his walks, the farmer need not confine the dimensions of the slab to those given above. If he prefers a longer and wider slab, it can easily be made. The first illustration shows the surface texture of a concrete slab of the above dimensions and the second is a drawing of a simple type of form in which slabs may be conveniently cast.

Concrete walks of this character would not only last for all time, but could be conveniently changed to other locations or extended without the necessity of digging and filling a foundation, erecting side forms or cutting joints. Like the concrete road, which has become a veritable boon to every farming community fortunate enough to be in touch with one, the slab walk could of itself accumulate neither mud nor dust, would grow stronger with age and exposure and contribute immensely to the comfort and convenience of its users.

The JOURNAL of AGRICULTURE

AND HORTICULTURE

Volume 18 *August 1st 1914* *Number 2*

QUEBEC CITY—VIEW OF DUFFERIN TERRACE AND LOWER TOWN, FROM THE CITADEL. DATE OF PROVINCIAL FAIR—AUGUST 31st TO SEPTEMBER 5th.

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

Don't slip up on that silo you are planning to erect this summer

Get your order placed now for an

IDEAL GREEN FEED SILO

LAST YEAR THERE WERE A lot of farmers who said they were going to put up a silo but who didn't because they waited so long that before they realized it harvest was upon them and they couldn't get the time.

THEN THERE WERE A NUMBER of others who didn't get their orders in until late and of course they all wanted silos at once and they had to wait until after the first frost had come before they could get their silos up and ready to fill.

THE REASON WE TELL YOU this is because we don't want you to be disappointed if you are planning to erect a silo this season.

THIS IS GOING TO BE OUR biggest silo year. We have almost twice as many silo orders on our books now as we had at this time last year. It seems as if everybody was planning to erect a silo and they all want "Ideals." We don't want to disappoint any one so if you are planning to put up an Ideal Green Feed Silo this season we would suggest that you get your order in promptly.

THERE IS A BIG ADVANTAGE in getting an early silo delivery. It gives you an opportunity to get your silo foundation ready and put the silo up in the slack spell between haying and harvest. If you wait until the last minute before ordering your silo you will run a big chance of not being able to get delivery at all; or if you do get late delivery, of having to hire extra help to assist you in putting it up.

REMEMBER THAT YOU WILL never begin to make the profit you ought to from your cows until you start to feed them silage. No cow owner or stock raiser can afford to get along a single year without a silo.

WHATEVER YOU DO, DON'T let the matter of cost of the silo stand in your way. It has repeatedly been stated by some of the best posted authorities on farm economics and by the most successful dairymen that even if a cow owner had to buy a silo every year he would still be money ahead. When you take into consideration that an Ideal Green Feed Silo if properly erected and given reasonable care will last from twenty to thirty years, you can see it would be a very profitable investment for you.

AS TO WHAT SILO TO BUY—If you get an Ideal Green Feed Silo you can be sure that nowhere can you buy a reliable and serviceable silo cheaper and that no matter how much more you pay you cannot buy a better silo than the Ideal.

THERE IS PROBABLY A DE Laval agent in your town who will be glad to quote you prices, terms, etc. If not, an inquiry sent to the nearest De Laval office will receive prompt attention.

Be sure to send for
FREE SILO BOOK

De Laval Dairy Supply Co.
Limited
Montreal Peterboro Winnipeg Vancouver
LARGEST MANUFACTURERS OF
DAIRY SUPPLIES IN CANADA

KODAK

Everywhere on the Farm

there are fascinating subjects for your Kodak—the harvest scene, old "Shep" driving home the cows, the calf butting his pail of milk, the intimate home scenes of everyday life and the good times with the children and even home portraits—all of these have a value that cannot be estimated. Every picture tells a story that you will always be glad to recall.

Kodaks $7.00 and up.
Brownies $1.00 to $12.00.

Ask your dealer for illustrated catalogue, or we will mail it free.

CANADIAN KODAK LTD,
604 King St. W., - TORONTO.

for your spare time. Watches guaranteed, highly finished, stem set and wind, neat sizes, engraved gold cases, new models, elegant chain free with boys' watch We have not space here to describe them, must be seen to be appreciated No money required until goods are sold Boys' watch free for selling 24 of our dainty handkerchiefs at 10 cents each. Ladies' watch free for selling 36.

CHIEF MFG. CO., 100 Chief Bldg.
BEEBE PLAIN, VT.

51 Chief Bldg., Beebe, Que.

Are you anxious to save Time and Money on the Work you are doing on your Farm at present and to get Larger Crops from your Farm or Orchard? If so, let us send you Free of Charge our Pamphlets on the use of

STUMPING POWDERS

———USED FOR———

REMOVING STUMPS AND BOULDERS
DIGGING WELLS AND DITCHES
PLANTING and CULTIVATING ORCHARDS
BREAKING HARD PAN, SHALE or CLAY SUBSOILS, Etc., Etc.

Figure yourself what Clearing your Farm is costing now or what you are losing in crops through not clearing

Write Us About Arranging Demonstrations.

CANADIAN EXPLOSIVES, Limited

MONTREAL, P. Q. CANADIAN EXPLOSIVES TRADE CXL MARK LIMITED VICTORIA, B. C.

Canada's Great Eastern Exhibition

SHERBROOKE, Que.

Thirtieth Annual Fair.

Sept. 5th to 12th

Large increase in Prizes **1914** Write for Prize List

Last distribution of the Automatic Stitcher of "Le Canada". Dont delay for there is only few dozen to spare.

It's made right—from high grade material. In the construction of our **PEERLESS FENCING** we use open hearth steel wire. By this process impurities are removed from the metal, thus eliminating one of the chief causes for the rapid rusting of fence wire. **PEERLESS is guaranteed to give you satisfaction. Send for catalog. Agencies nearly everywhere. Agents wanted in open territory.**

THE BANWELL-HOXIE WIRE FENCE CO., Ltd., Winnipeg, Man.—Hamilton, Ont.

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 101,360
FRENCH, 91,600
ENGLISH, 9,760

Volume 18
AUGUST 1st 1914
Number 2

EDITORIAL

THE SHERBROOKE FAIR

WE have received a copy of the prize-list of the thirtieth annual exhibition of the Eastern Townships Agricultural Association to be held in Sherbrooke, September 5th to 12th. The Association has, as usual, received donations for special prizes from a number of the live stock associations and from the banks, as well as some from local agricultural societies and from private individuals. The prizes, particularly in the live stock classes, are generous and will no doubt attract exhibits of the high class characteristic of the Sherbrooke Fair. There will be the usual dairy, butter-making, and judging competitions and a competition in seed oats for farmers' sons and academy boys. Poultry entries must be made on or before Saturday, August 29th, live stock entries on or before Monday, August 31st, and entries in other classes on or before Wednesday, September 2nd. Entry fees must accompany applications. Intending exhibitors should secure a copy of the prize-list from the Secretary-Treasurer, Mr. H. B. Miller, Sherbrooke.

GOOD-LOOKING FARMS

THERE is nothing more beautiful and attractive on God's green earth than a farm with shade trees and flowers, with well-trimmed lawns, neat fences and painted barns, and with a house that looks like a home. As we travel through the country we frequently come across such good-looking farms, and we find ourselves congratulating the young people who have the good fortune to grow up under such pleasant and inspiring surroundings.

Victor Hugo, the great French novelist, once said, — "The beautiful is as useful as the useful". There is a world of truth in this statement. Youth is responsive to the beautiful that is in harmony with nature and craves for the satisfactions which beautiful things afford. The impulses that are called forth through contact with pleasant country scenes are of great value in the upbuilding of character. It often happens that the whirr and bustle of city life are sufficient to pull away many of our young people from the country, but sooner or later these attractions lose their force and the call of the pleasant country life becomes irresistible.

Good-looking farms are valuable assets to any community. From a commercial standpoint the expenditure of money in keeping the buildings painted and the fences in good repair, and in planting shade trees about the farm is a good investment. Just why so many of our farms present a bare appearance when the presence of trees, for example, would increase their value greatly is hard to understand. Farmers' Clubs would be doing a most valuable work if they could induce their members to begin planting trees and beautifying their farms.

MAPLE SUGAR SCHOOLS

THE appropriation to the maple industry out of the Federal Grant for the Encouragement of Agriculutre was devoted by the Quebec Department of Agriculture to the establishment of three sugar-making schools. That the success of these schools surpassed the expectations of the most sanguine is apparent from the official figures published below. The school at Beauceville was under the superintendence of Mr. Alexander Bolduc, and its season extended from March 29th to May 5th. Mr. L. J. A. Dupuis, Provincial Lecturer on Maple Syrup and Sugar, had charge of the school at Ste. Louise, which was in operation from April 2nd to April 20th. At Minerve, in Labelle county, Mr. J. H. Lefebvre of Waterloo, the secretary of the Sugarmakers' Co-operative Association, was in charge and the season lasted from March 26th to April 4th.

Statistics of the Sugar-making Schools.

	Beauceville	Ste. Louise	Minerve	Total
Attendance.				
Students	5	5	7	17
Visitors	1132	368	73	1,573
Products.				
Syrup, gallons	512	335	345	1,192
Sugar, pounds	......	145	410	555
Sugar wax, pounds	......	600	......	600
Trees.	3000	5000	3100	11,100

It will be observed that large scale operations were conducted at all the schools, and this was no doubt a factor in the attraction of visitors. In all, nearly 1600 persons visited the schools, and there can be no doubt that most of those who were producers went away with new knowledge or with a new determination to improve their methods. The number of pupils enrolled, although not large, is gratifying when one considers the novelty of the enterprise and the difficulty of sparing the young men from the home farms in the sugaring season.

In a recently circulated letter of the co-operative association the hope is expressed that two or three additional schools will be opened next year.

FARM ADVERTISING

THERE is a striking difference between a city or town business man and a farmer, in the fact that the former goes to a great deal of trouble and expense to advertise his business while the latter seldom spends money on printers' ink and painters' signs. Just why there should be this difference in business methods it is hard to make out. This thing is certain, however, — the wide-awake farmer who has something good to sell would be amply rewarded if he made the public aware of the excellence of his wares. In the first place, he would take a greater pride in his farm and in the production of his butter, honey, or whatever he may have to sell; and in the second place he would be able to secure a higher price than his neighbor who does not advertise.

Every farmer should see that a plain, neat sign-board is placed at his front gate, giving not only his own name but the name of the farm. If he is specializing in stock or dairy produce or any other industry he should state the fact on the sign-board.

Moreover, every farmer should use good printed stationery in his correspondence. It is wonderful what an impression this makes upon the city man; in fact, it frequently means dollars and cents. It adds dignity and increased respect to the farming profession. If we wish others to treat us with dignity and respect we must take ourselves more seriously and do things in a manner which carries dignity and respect.

THROUGH NEW ENGLAND

THE editor took advantage of a few days holidays in early July to visit some af the agricultural colleges of New England, with the object of comparing the courses of study given there with those in Canadian colleges, and of finding out the agricultural conditions in New England. The Agricultural College in Vermont is situated at Burlington and occupies a prominent site overlooking the city and Lake Champlain. As is the case in many state universities the Agricultural College is overshadowed to some extent by the other colleges of Medicine, Engineering and Arts, and as a result the course offered to agricultural students seemed to us not sufficiently differentiated. In other words, scientists are developed rather than agriculturists.

New England is a beautiful country; its hills and valleys are romantic. It is no wonder that a New Englander, no matter how far he may roam, has a very tender regard for the rural scenes of his boyhood days.

Dairying is a prominent industry in Vermont, Massachusetts and Connecticut, and considerable attention is given to the training of students along this line at the agricultural colleges. At Amherst, Massachusetts, the college farm has been made an important educational agent. As with our colleges, experiments have been conducted for many years, testing out the best varieties of grains and fodder crops for Massachusetts conditions. At Storrs Agricultural College, Connecticut, in addition to dairying, much attention is being given to the development of the poultry industry. We saw the hillside with its rows of colony houses where the International Egg-laying contest is being waged, and we heard the bacteriologist discuss the "white diarrhoea" problem and its cure.

CONTENTS

EDITORIAL.—The Sherbrooke Fair; Good-looking farms; Maple sugar schools; Farm advertising; Through New England; An agricultural college education for the farmer's son; Professor Klinck leaves Macdonald College; The Ontario Agricultural College; A big problem and a novel suggestion; General price level unchanged.

ORCHARD AND GARDEN.—Fruit Growers' Convention; A visit to some Quebec apple sections; Floriculture notes for August and September; A trip to Massachusetts Agricultural College; The Pure Maple Sugar and Syrup Co-operative Agricultural Association; Orange rust on raspberry leaves.

FARM AND FARM CROPS.—The Cairnside picnic; In the root field; Notes on the cereal husbandry department, Macdonald College; Impressions of a trip through Western Ontario; Among the Howick Ayrshire breeders.

LIVE STOCK.—Flies in the stable; Sheep-killing dogs; Green crops for sheep and lambs; The dairy Shorthorn in Canada; Official records of Holstein-Friesian cows; Auction sale of sheep, swine and cattle.

DAIDY.—What the public wants; Bacteria and dairy farming; What makes milk and butter yellow; A big difference; Cows that wear well; Men well satisfied.

POULTRY.—Quality in eggs; American Association of Instructors and Investigators in Poultry Husbandry; Swat the rooster; Poultry notes; Chicken thieves.

WOMAN'S WORLD.—Homemaker's Club at Lennoxville; Foods and Food Preparation; The Children's Homer; Takes the bakache out of housework.

GENERAL INTEREST.—Third Year results at Macdonald College; Hunting spirit in the air; Quebec Fairs, 1914; Canadian engineers inspect concrete roads; Destroying quack grass; Care of the machinery; Silage the best succulent fodder for winter; Estimating the Value of a Cow.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

New England farming pays because markets are good and very close at hand. But, as a prominent agriculturist told me, — "The farmers have done well, but they have robbed the soil by poor farming. The problem now is to get them to farm better, and this is the real purpose of the Lever-Smith Bill recently passed by Congress which provides for extension lecturers and demonstrators in each state of the Union".

After this casual survey of agricultural conditions we come to the conclusion that our agricultural colleges prepare our young men more effectively for farming than do those of New England, but that, perhaps, their young men are trained better for professional work; that agriculturally Quebec is as far advanced as New England and possesses larger stretches of arable land; but that the proximity of the many large markets of New England gives the farmer over the line a slight advantage.

W. L.

AN AGRICULTURAL COLLEGE EDUCATION FOR THE FARMER'S SON

NOT long ago a well-to-do-farmer stated at a farmers' picnic that he was not in favour of sending young men to the Agricultural College. The reasons he gave were not very clear, but he claimed that if college-trained young men were placed in charge of many farms in the neighborhood they could not make them pay. Just what experience he had with such men he did not state, but we are of the opinion that it was very limited indeed.

In every section of the province may be found farmers who see little use in a college education. Moreover, instances may actually be found where educated young men were failures as farmers, but were these instances even more numerous than they are a college education for the farmer's son should not be denied him.

A lawyer or a surgeon does not become expert in his profession at college, but in the exercise and practice of many years. So a young college graduate in agriculture is not an expert farmer, but gradually acquires the expertness by practice after many years. The college training permits him, as it does the lawyer or the surgeon, to become expert in a much shorter time than is the case with the man without such a training.

The expert farmer is the result of the combination of three factors — the boy, the training, and the opportunity. Some boys are natural born farmers, while others are otherwise, and no amount of college training will make them successful farmers.

Then again, opportunity plays an important part in the making of a good farmer. A father may readily mar his boy's career by "pouring cold water" on all the visions of his boy who is attending college, and by refusing to allow the boy to try out the new ideas he has brought home.

The training at an agricultural college, while to a certain extent practical, deals largely with principles and how they may be applied. The real value of the training lies in the ability to do more efficient work and service. In other words "to make men and women of greater usefulness to themselves and to their fellows; to make it possible to do more and better work, and to use their energies and their influence so that they will leave this good old world better than they found it".

A farmer should also be a *citizen* and take his part in the development of his community. Experience tells us that the men who are the real leaders in this work are college graduates who know how to do things.

No, we cannot advise our farmers' boys to stay away from the Agricultural College. On the other hand we believe that the best investment a father can make for his son would be to send him for two or three years to college. As our old friend, Dr. Mills ex-president of the O.A.C., used to tell the farmers; — "So long as you educate some of your sons for the medical, the legal, or the business profession and give the hard-working son on the old farm nothing more than the elementary school training, he will be a hewer of wood and a drawer of water to his educated brothers as long as he lives".

PROFESSOR KLINCK LEAVES MACDONALD COLLEGE

THE Province of Quebec loses a valuable agriculturist in Professor L. S. Klinck who resigned his position as Professor of Cereal Husbandry in Macdonald College on August 1st, to become Dean of the new Agricultural College of the University of British Columbia near Vancouver. But Quebec's loss is British Columbia's gain. Professor Klinck is a strong man in his particular field, perhaps the strongest in Canada and among the foremost in America. He came to Macdonald College on the invitation of Dr. Robertson in 1905 when building operations were just beginning, and by the fall of 1907 when the College opened its doors to students for the first time Professor Klinck had his field experiments well organized and fairly under way. Since that time he has developed the experimental side along many lines and has been able to isolate by selection several valuable strains of grains.

Two years ago he published (see Journal of Agriculture, July 1st, 1912) the results of five years experiments with grains for Quebec. These results should be of great value to the practical farmer, as they indicate at a glance the best varieties of grains for conditions such as prevail in this Province.

Considerable work has been done also with alfalfas and clovers, with timothy strains, with corn, and with roots and soiling crops. Result of great practical importance have already been obtained which will no doubt be published in due time.

Professor Klinck is an excellent class instructor, being clear, concise, deliberate and methodical, and as a public speaker on farm crops he is in demand at conventions of farmers.

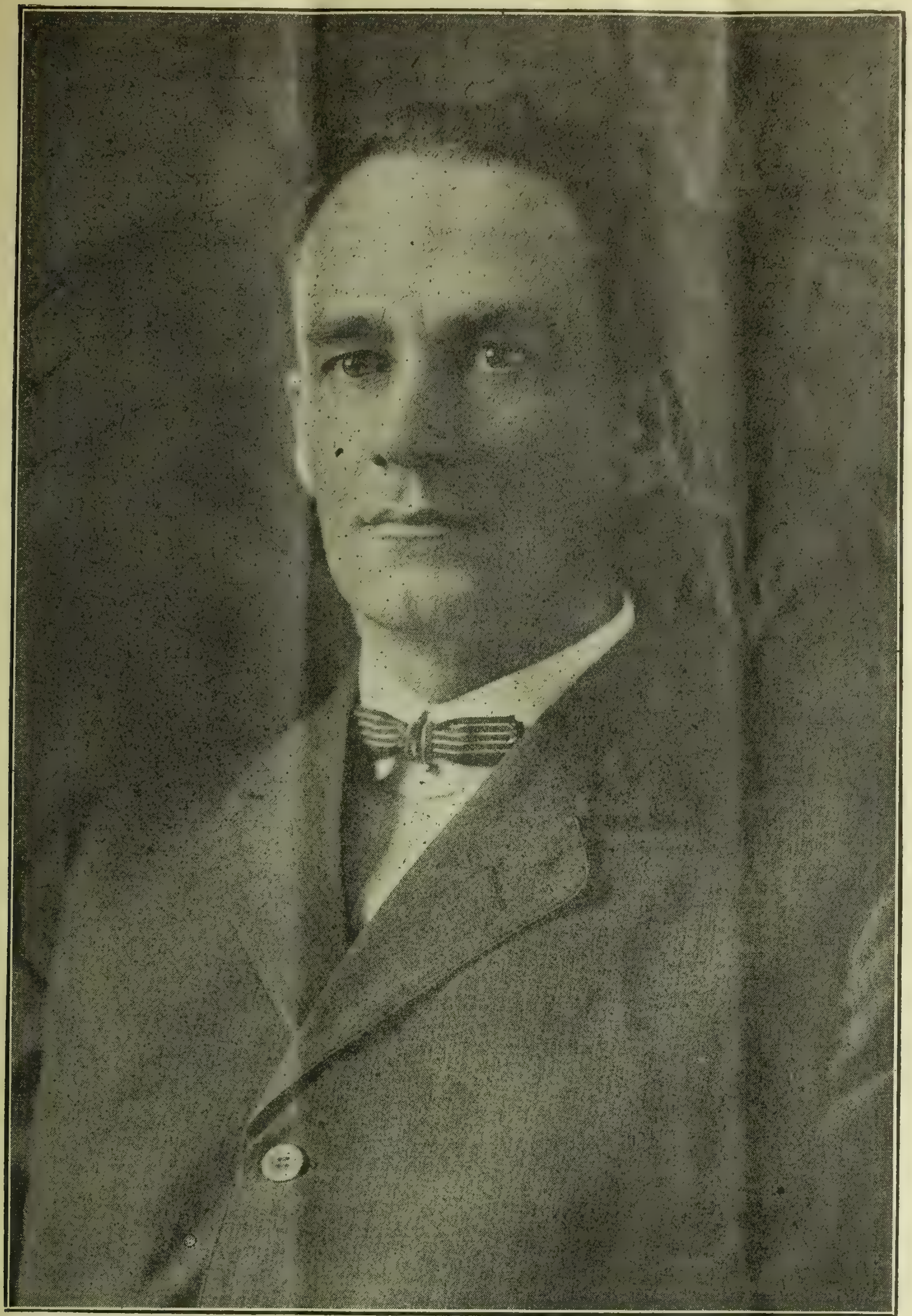
Professor Klinck was born on a farm a short distance north of Toronto, and grew up on the farm. He taught a country school for two or three years, then went to the Ontario Agricultural College, Guelph, from which he graduated with the degree of B.S.A., specializing in Biology, but having much practical experience in the Cereal Husbandry or Agronomy department. After this he went to the Iowa Agricultural College for post graduate work in Farm Crops. There he secured the degree of M.S.A. and was placed on the staff. In 1905 he came to Macdonald College.

While we regret the departure of Professor Klinck and his family we cannot help but feel that Quebec was fortunate in having secured his services for so long a period as nine years. Several classes of bright young men have been trained by him for carrying on the work which he originated in this Province.

We wish Professor Klinck every success in his new position in the West.

THE ONTARIO AGRICULTURAL COLLEGE

THE report of the Ontario Agricultural College for 1913 contains much information of general interest. The total number of students in attendance was 1560, of whom 1060 were studying agriculture and 500 were enrolled at the Macdonald Institute, studying domestic science or taking teachers' courses in nature study and elementary agriculture and horticulture. Of the



Professor L. S. Klinck, head of the Cereal Husbandry Dept. Macdonald College, recently appointed Dean of the College of Agriculture, University of British Columbia, Vancouver.

students in agriculture, 609 were enrolled in the general course (two-year and four-year students); the remainder were taking short courses, varying in length from two weeks to three months.

The expense of running the college for the year amounted to $265,750. The revenue from fees, sale of produce, etc., was $82,600. The expense to the province was, therefore, $183,150, an average of about $120 per student. It is true that some of the students are at the college for only a few weeks. But on the other hand the services of the College to the Province are by no means confined to the training of students.

On pp. 141 to 142 in the midst of the report of the Professor of Field Husbandry we find this interesting item :

"A knowledge of the history of barley growing in Ontario as influenced by the Ontario Agricultural College furnishes a strong argument for the existence of the College from merely a financial standpoint. The entire cost of the institution has been far more than paid back to the province by the increase in the barley crop as the direct result of the improvement in the yield of barley through selection. As near as we can ascertain at the present time from 94 to 96 per cent. of all the barley which is now grown in the province belongs to the Mandscheuri and to the O.A.C., No. 21, varieties. According to the report of the Bureau of Industries for Ontario the yield of barley per acre for the past fifteen years as compared with the fifteen years previous has had an increase of between 22 and 23 per cent. in yield per acre. The market value of the barley crop in Ontario in 1911, which is the last year for which we have a financial record, was $12,000,154.00. Twenty-two per cent. of this amount would be $2,640,033.00. This represents the annual increase in money value of the barley crop, owing almost entirely to the increase in yield per acre of the crop. The improved varieties of barley introduced have had a very marked influence in bringing about this increase. Two and one half million dollars per annum is a very large amount and represents about fifteen times the cost of maintenance of the College."

When we read, farther on, that there is a good prospect of a similar increase in the oat crop of the province as the result of the experiments conducted at the farm, and when we reflect upon the influence of the College in the improvement of the live stock of the province, its work in promoting underdrainage and the intelligent use of fertilizers, its part in building up the dairy, poultry and beekeeping industries and in improving the conditions of rural life in the home and school, we realize that Ontario's expenditure upon the Agricultural College is without exception the best paying investment the province could possibly make. If any mistake has been made it has been in the way of penny-wise economy. The College could undoubtedly spend more money to equally good profit.

Items of interest are to be found in all the sections of the report. The Professor of Physics, for example, writes entertainingly about drainage demonstrations and experiments with cement tiles; the Professor of Dairy Husbandry describes a combined test for casein and fat which will enable the dairyman to make a fairer comparison of the values of different lots of milk for cheese-making than is possible with the Babcock test alone; the Professor of Animal Husbandry gives the records of the College cows (chiefly Holsteins and Ayrshires) and describes experiments with swine; and the Professor of Field Husbandry writes upon scores of subjects of direct interest to the practical farmer.

We commend this report to the attention of all interested in education and in agricultural experimentation.

A BIG PROBLEM AND A NOVEL SUGGESTION

Loss of Soil by Erosion. Tree Crops as a Remedy

A topic which receives much less attention in our agricultural discussions than it deserves is brought into prominence by two brief articles recently published in "Science". The authors of the articles are both members of a committee of the Social and Economic Section of the American Association for the Advancement of Science, appointed to study the question of soil erosion, and it is to this question of vast importance that their contributions refer. The chairman of the committee, Mr. Judson G. Wall, estimates that in addition to many lives the United States loses annually one hundred million dollars in property by the destructive action of floods. But this loss of property by destruction, serious as it is, is not by any means the only loss incidental to the recurrent floods. Mr. Wall estimates that the caving in of the levees which are built along the banks of the lower Mississippi results in the annual loss of nearly ten thousand acres of the best land in the world, and that two and a half times as much silt is annually deposited in the Mississippi channel as was excavated in digging the Panama canal, and great annual expense is entailed in dredging out the channel. The overflow of the flooding rivers drowns the rich lowlands, destroying or vastly decreasing their productive power, and in addition the high land not only loses by erosion of soil but is robbed of moisture that is greatly needed in growing crops.

The amount of water required by the average soil for full productivity is sixty inches each year. The average annual precipitation (rain and melted snow) in eastern North America is forty-eight inches and it is estimated that 30 per cent. of this is allowed to run to waste. In other words, the soil receives little over half the quantity of water necessary for a *full* crop and little over two-thirds of what it is possible for it to have under the actual climatic conditions.

THE GARDEN AND ORCHARD

FRUIT-GROWERS' CONVENTION

THE Quebec Pomological and Fruit-growers Society will hold its summer meeting at Abbotsford, county of Rouville, on September 9th and 10th next.

Discussions will take place upon the work accomplished by the Dominion lecturers who will have just terminated their series of lectures upon horticulture. They will deal with marketing, packing, the selection of fruits and all subjects of interest to fruit-growers.

It is hoped that all those who are interested in fruit-growing will be present at this meeting. They should meet there not only farmers but also professional men, merchants and newspaper men, whose influence and advertising have helped to spread among the farmers the knowledge necessary to profitable fruit-growing.

A VISIT TO SOME QUEBEC APPLE SECTIONS

THE writer had the pleasure of enjoying recently an automobile trip with Mr. Peter Reid, secretary, and Mr. Norman Jack, director, both of the Quebec Pomological Society. This trip was taken with a view to visiting several of the orchards at Covey Hill and intervening points. The party left early in the morning from Chateauguay and arrived at Covey Hill at noon. We later continued to Huntingdon and then returned to Chateauguay in the evening.

A number of the better orchards were visited and a large number of others were noted as we passed by. It was very easy to pick out the orchards that were being properly cared for, and unfortunately for the apple industry of the Province, these well cared for orchards are not in the majority.

In the past much has been written and said in regard to apple orcharding, and that this work has not been in vain is evidenced by some very fine orchards that were seen during the day's trip. However, it seems that most of the apple growers, wherever they may be, are "from Missouri", in that they must be shown before they will believe, and this no doubt accounts to a large extent for the apparent slowness with which spraying and other practices in the orchard are taken up. One can hardly plead that it is a lack of information, for there are now so many reliable sources to which one may turn. To handle an orchard successfully requires a great fund of knowledge, including that of spraying materials, insects and diseases.

That there is still a great lack of spraying in the Province is apparent by the large number of apple trees that have been defoliated by caterpillars and it was a pleasure to see the well sprayed orchards that were noticeable by their full quota of apples, while the defoliated trees had no crop. Sometimes a man may get discouraged with spraying — partly because he expects results too soon, or in some cases he might not give these sprayings at the proper time, or they might be improperly made, as is frequently the case. Troubles with the spraying pumps are unavoidable, but to be successful all such troubles must be overcome promptly in order that the work may be done efficiently.

At Chateauguay there are some good orchards, and it is easy to see that many of the apple growers have mastered the art of caring for their trees and are well pleased with their results in spraying. They are using their first power-sprayers in this locality, although the majority are still using hand-pumps. Where many trees are to be sprayed, the power-sprayers are rapidly replacing the hand-pumps, as with these the work can be more thor-

---

Col. Freeman Thorpe, who owns a large experimental farm in Minnesota near the headwaters of the Mississippi, has so managed his land that no water has run off it for seventeen years. His farm consists of forest, pasture and cultivated land, and he estimates that the annual growth both of trees and of grass has been *doubled* by his system and the productivity of the cultivated land greatly increased at the same time. His methods are said to be exceedingly simple and inexpensive. The United States Department of Agriculture has undertaken to study them and make them more generally known.

Prof. J. Russell Smith, who contributes the other article to Science, was appointed a subcommittee to study the relation of tree crops to the erosion problem. His investigations have led him to make comparisons of American agriculture — particularly that of the central and southern states — with that of southern Europe. He points out that the agricultural experience of the Teutonic races obtained in northern Europe does not apply well to American conditions. The European grows mainly grains, grasses and clovers, crops which cover the whole surface of the ground, and hold it with a root mass. In America, three of the greatest crops — corn, cotton and tobacco — are bare-ground crops. The heavy summer thundershowers characteristic of the American climate work havoc upon these open soils, and erosion becomes a factor of most serious importance.

The remedial measures advocated by Prof. Smith are terracing and tree-crops. Terracing has been practised to some extent in the Southern States and a new system known as the 'Mangum terrace' has been invented there, which is said to be a great improvement upon any of the systems previously used. It consists of wide gentle ridges plowed up along the face of the slope so that the water flows slowly and harmlessly along it. Its wide gentle slope permits the planting and harvesting of crops by machinery and at the same time prevents loss of water and the washing away of the soil.

The planting of trees in forest form for timber only, while effective in controlling the water-supply, involves too long-term investment for the ordinary farm land owner. However, trees exist which give good returns in annual crops without too long a period of waiting. In fact the land that is in harvest-producing trees is usually the heaviest yielding and most valuable land. Witness the *orchards* everywhere. Prof. Smith states that the king of all crops as measured by the amount of food produced and the value of the land is the date. Fruits, however, that is to say, *succulent* fruits such as are most familiar to us, constitute only a portion of the tree-crops. Southern Europe produces human food from trees in abundance in the form of olives and nuts and also derives a considerable portion of its animal feeds from tree crops. Among the tree-produced forage crops of Europe are the carob bean, the acorn, the chestnut and the fig. Among the American trees capable of producing similar forage, Prof. Smith mentions the honey locust, the oak, the chestnut, the pecan, the persimmon and the mulberry. In addition we have trees capable of producing human food other than succulent fruit, — such nut trees as the hickory, the hazelnut, the walnut and even the oak; such fruit trees as the olive, the date and the fig. To the list we would venture to add the sugar maple as a tree yielding an annual crop of valuable human food, as well as a wood of great usefulness.

Now, planting such trees in wood-lots is not the only way of growing the tree-crop. In a popular article in the July number of the Century magazine, Prof. Smith advocates what he calls "two-story" farming, that is to say growing trees and cultivated crops in the same field. "Approximately nine-tenths of the arable area of Majorca, one of the Spanish islands in the Mediterranean", he tells us, "is planted out to crop-yielding trees. That makes one-story agriculture. Then beneath the trees grain is grown. That makes the second story".

Ordinarily the grain crop yields the farmers a living, and the tree-crop furnishes the profits. It is rare for both crops to fail. "The farmers of south-western France annually send to this country millions of pounds of choice Persian (so-called English) walnuts, and yet there are not ten orchards in the whole region." The trees are grown in the wheat fields.

The Italian farmers follow the same system with the mulberry trees upon which they cultivate the silk-worm. The mulberry trees are planted across the wheat fields in widely separated rows so as not to shade the wheat. Then they carry the principle one step farther and plant grapevines beside the mulberry trees. Thus the same field yields bread, wine and silk — food, drink and clothing.

With us in Canada neither flooding nor soil-erosion is so vital a problem as in the southern States. Our summer thunderstorms are less severe and our agriculture bears a closer resemblance to that of northern Europe than theirs; we have less of our land in bare-ground crops. Nevertheless the losses we suffer both from the flooding of low lands and from the washing away of hillsides are very considerable, and in common with our neighbours to the south we suffer from droughts due to the too rapid flowing-off of the rain and melted snow. It is generally conceded that the primeval forests retarded and regulated the off-flow of the precipitated water, and it is quite possible that tne decreased yields of grain obtained in our eastern lands result quite as much from the removal of this regulation of water-supply as from actual depletion of the plant-food of the soil. At any rate the want of regulation of water supply contributes to the loss of plant food by leaching. If we retained upon the land all the water that falls upon it, or only allowed so much of it to run off as had percolated through the soil, it is possible that we might repeat Col. Thorpe's experience of increased crops. At any rate, for those who have hilly farms, the possibilities of the mangum terrace and the tree-crop are well worth thinking over.

GENERAL PRICE LEVEL UNCHANGED

THE Department of Labour's index number of Wholesale Prices stood at 136.2 fofr June as compared with 136.2 in May and 136.4 in June, 1913. Advances in oats, barley, corn, flaxseed, cattle, beef, lamb, dairy products, sugar, glucose, wool, cotton, hides and tallow, lead, and anthracite coal, were offset by declines in wheat, hogs, iron, brass, tin, silver, spruce, miscellaneous building materials, furs and raw rubber.

In Retail Prices the features of the month were a general advance in potatoes and the continued decline in butter. Several declines in mutton, lard and fish occurred but eggs were higher in many localities and sugar began to advance.

Spraying orchard with lime-sulphur by means of a gas-motor engine.

oughly done and, in addition, it is economy in orchards of five or more acres.

From Chateauguay to Covey Hill some small plantings have been made and these were doing fairly well, although some of the trees were struggling along in a hay or oat field. The old orchards were, for the most part, neglected, but judging from their size, freedom from winter injury and their general appearance, apple trees should do well, provided proper varieties are planted and reasonably good care taken of the trees.

At Covey Hill, one of the finest orchards in the Province was seen. This orchard belongs to Mr. Waddell and is one of the demonstration orchards under the control of the Quebec Government and the Pomological Society. The trees in this orchard were quite large and very vigorous, with clean, healthy foliage and all are carrying a very fine crop of fruit, many trees of which will have from five to eight barrels of apples this year. Considerable spraying has been done in other orchards in this neighbourhood and a few are practising cultivation with a summer-sown cover-crop.

From Covey Hill the road led to Huntingdon via Franklin Centre and Rockburn, through a country well adapted to apple growing, but unfortunately there is little done in the care of the orchards. Too many varieties, many of which are inferior, distance from market, and caterpillars are some of the more serious difficulties. Through this district there are many orchards, some of which are quite extensive, but in only some half a dozen is there any attempt to handle the orchards satisfactorily. This is a district that with better railroad facilities should be a valuable apple-producing centre, as the trees grow well and with proper care should produce profitable crops.

From Huntingdon back to Chateauguay only a few apple trees were seen; these consisted of small groups of trees planted around some of the farm homes and it was the exception to see any that had not been defoliated.

It was evident during the day's trip that those growers who were spraying effectually and giving attention to pruning and other orchard practices were reaping results in better crops of good fruit. These good orchards are already having their effect in causing an increased interest to be taken in adjoining apple orchards, and no doubt the next few years will see a marked improvement throughout the many sections where apples are grown.

The trip proved a very enjoyable one, as some old friends were met on the way, and an opportunity was taken to inspect more closely some of the orchards where the growers are taking care of them along proper lines.

T. G. BUNTING.

FLORICULTURE NOTES FOR AUGUST AND SEPTEMBER

Starting House Plants for the Winter. Summer Management of Sweet Peas and Asters

TOWARDS success in maintaining a continuous display of flowers during the fall, winter and spring months, a few hints at this time will be very helpful to many lovers of flowers who are just feeling their way in this branch of horticulture. The average amateur has not the facilities nor the experience necessary to grow many of the pretty objects which gardeners and florists have throughout the season; no, he has to be content with such plants as are more or less easily grown. No class of plants is so easily grown as the bulbous variety. This class includes freesias, calla or arum lily, hyacinths, tulips and narcissus.

Freesia bulbs can be obtained in August from any seedsman and should be potted up right away; the bulbs are small and in order to have a well-furnished pot several bulbs are required to each pot. In potting, sink bulbs just underneath surface, water thoroughly and treat as cool as weather conditions will permit, and expose to the full sunlight after growth has commenced. As growth advances place a few stakes round the pot and use ordinary black cotton thread around the stakes. This supports the stalks which otherwise would fall down with their own weight. This plant can be had in flower by the end of January. It lasts in flower for some time; then by having a few pots and keeping some of them very cool a succession of flowers can be maintained covering quite a period.

Calla lily.—This is a plant that should be in every amateur's collection as it is so easily grown and flowers from fall until the end of May. Bulbs of this plant can be had any time now from any seedsman. Pot bulbs singly in 6 or 7 inch pots, water thoroughly and grow slowly, keeping them as cool as possible while at the same time exposing them to the full sun.

Roman hyacinths and narcissus (Paper white) are two classes of bulbs which can be had in flower as early as December, and a succession may be kept up by treating a number of pots in different temperatures, some very cool, others moderately warm, and still others warmer. Bulbs of these can be had early in September.

To further extend the season and lend variety, *Dutch bulbs* are employed, such as hyacinths, tulips and narcissus in their various types. These bulbs usually can be procured by the end of September, and if handled properly a succession of flowers of each can be kept up till quite late in the spring. The bulbs should be potted up without delay in good garden loam into which sufficient sand has been worked to thoroughly drain the soil and keep it open. Large hyacinth bulbs may be potted up singly, but tulips and narcissus require several bulbs in each pot to make a satisfactory show. Sink bulbs deep enough so that no part of the bulb shows up above the finished surface of soil. The potting finished, place the pots in some corner out of doors, thoroughly soak them with water, then cover over to the depth of six inches with cinders or sand, giving this a good soaking also. No more attention need be given them for six weeks. During this period the bulbs, buried as they are, are getting cooler conditions than it would be possible to give them in any other situation and this is very necessary if best results are expected, the aim being to build up a good root-system without encouraging top growth. Then when the bulbs are introduced to more heat and growth is rapid, there is an abundance of roots to take care of the growth, whereas if both root and top growth move together unsatisfactory results are obtained.

After six weeks remove pots from this covering, select a few of the most forward ones and grow along in a warm, sunny window; place the remainder in a cold, damp cellar or other such place where the temperature is quite low but where they will not freeze. Under such treatment growth is very slow, and by picking out the most forward ones from time to time to replace the ones that are going out of flower a succession is maintained till quite late in spring. In order to further extend the season for these bulbs it is necessary to place the pots out of doors in some corner after the six weeks treatment already referred to and cover over as soon as severe weather sets in with from two to three feet of dry leaves or strawy manure.

Primulas and cyclamen, favorite winter-blossoming plants, should be making a good growth now and should receive their final potting, using 6 in. pots, this size being large enough unless plants are of unusual size. Grow these along as cool as possible out-of-doors in frame, and shade from the strong sun.

Hydrangea Otaksa or *Four Seasons* is an exceedingly popular and useful plant of simple cultivation when allowed to flower in its natural season during August. Many nice specimens may be seen from time to time, but as a rule, with the amateur, quite large plants very often show no flowers or very few. The reason for this is that the plant is not properly treated either the whole or part of the season. This plant requires full sunlight, more especially so during the period when finishing its growth, in order to thoroughly ripen the growth the plant has made. Toward the latter part of September protection from early frosts has to be given; the average amateur knows this, but the protection he affords is not conducive to the welfare of the plant. Protect from early frost by any means you like, but as soon as the temperature rises above the freezing point expose plant to the full sun. Give water sparingly to induce the ripening down of the plant.

The hydrangea is a deciduous shrub, as the maple is a deciduous tree. You see all around you in autumn leaves dropping continually from the maples. What does that mean? It means that the tree has finished its growth, ripened its wood, the leaves have performed their functions and dropped to the ground, and the tree is at rest until called upon by nature to resume its growth. The hydrangea therefore must ripen down gradually and shed its leaves before it is at rest. In order to accomplish this, keep the plant as cool as possible and allow soil to dry out before giving water. When all the leaves have dropped give plants a thorough soaking with cold water and place in a damp cold cellar where the temperature does not rise above 40 degrees. If the cellar is damp and pots are resting on an earth floor no further watering will be necessary; otherwise see that soil is kept moist.

Another winter flowering plant of merit seldom seen in the home is the *carnation.* This plant flowers the entire winter and spring; it requires to be grown fairly cool to obtain best results. The plants may be obtained during August or early in September from any florist who grows them for cut flowers.

Sweet peas during the early part of the summer did not make a satisfactory growth owing to the lack of moisture in both soil and atmosphere. Frequent cultivation with a thorough soaking twice a week during dry weather will help them along. If grown entirely for cut flowers keep picking daily. If, however, the intention is to allow flowers to fully develop on the plant, remove flower stalk as soon as petals have dropped. Pay strict attention to this, as if seed pods are allowed to develop there is a big drain on the resources of the plant in reproducing itself. If flowers are wanted for show purposes, allow but few growths to a plant and also but few spikes to each growth.

Asters, despite the dry spell in the early part of the season, have made rapid growth since the recent rain-falls. Keep well cultivated to conserve moisture, and with cooler weather ahead there is no reason why fairly good flowers should not be obtained. If intended for show purposes only the large central bud should be allowed to develop; remove all others.

A. H. WALKER.

A TRIP TO MASSACHUSETTS AGRICULTURAL COLLEGE

Editor, Journal of Agriculture:—

THIS is certainly a beautiful setting for a college. The narrow valley formed by the Connecticut river with its surrounding mountains covered with timber make as beautiful a setting as one could wish for. Rainy weather has made working unpleasant, but after the long dry spell one can well afford to take a rest. The rainy season shows us the value of our clean steady cultivation. There are no weeds to grow and the plants can go ahead by leaps and bounds.

Last week I took my class in gardening over to Springfield to see two large market gardens. I wished them to get an idea of gardening under real commercial conditions. We went from here by trolley through as pretty a country as one could wish to see.

The main crops of this section are tobacco and onions. Thousands of acres are devoted to these crops all through Massachusetts and Connecticut in the Connecticut River valley. I never before saw tobacco shaded. They make a sort of tent of cheesecloth strung on poles. One firm has over two hundred acres under one stretch of cheesecloth. It is certainly an expensive method, but as the price paid for the tobacco is five or six times as much as is ordinarily paid it should give a good return.

Each of the farms we visited was over one hundred acres in extent, practically all of which was under vegetable crops. The greenhouse space was not as large as one would expect on such a farm, but I imagine with the outside work they could not very easily handle it. I never before saw intensive cultivation used on such a scale. One would find rows of celery 5 ft. apart (seed sown directly in the row), between being four rows of seed onions each twelve inches apart. These onions were beginning to bunch. As soon as the onions were cleaned out radish or spinach was sown. One field was set to horse-radish. Between each set in the row had been planted cabbages which were then being harvested. In one place I saw celery with carrots in between, and every second row of celery had Golden Bantam corn planted next it.

Every means is taken to produce crops quickly and steadily. Companion and intercropping are used to the utmost. The celery was being thinned and the thinnings sold to other growers throughout the East.

Skinner's irrigation system is in use in many places and is giving good satisfaction. Some have it on stakes in the ordinary way; others have it suspended from a cable.

Taken every way it was probably as fine a sample of extensive intensive gardening as one could find.

A. H. McLENNAN.

Macdonald College.

THE PURE MAPLE SUGAR AND SYRUP CO-OPERATIVE AGRICULTURAL ASSOCIATION

Circular issued to members on July 1st, 1914

WE are pleased to inform you that in 14 months we have succeeded in obtaining what individuals have tried to get and fought for over ten years to secure, and that is an amendment to the Adulteration Act to prevent any one from using the word "Maple" on labels of packages not containing the genuine maple sugar or syrup.

We have asked the Directors of the Provincial Exhibitions at Quebec and Sherbrooke to offer larger and a greater number of prizes than they were offering in the past on maple products and they have kindly consented.

Below you will find a list of these prizes and we earnestly solicit you and every member of our Association to become a competitor at one or the other of these Exhibitions.

All you need do is to send by express to the Exhibition Company the quantity of the sugar or syrup called for in the class you wish to compete in, and some one will receive the articles which will be returned to you in the same way, if you do not wish to attend the Exhibition yourself.

Please correspond with our Secretary in advance in regard to your intention to do so.

THE PRIZES OFFERED ARE AS FOLLOWS:

AT QUEBEC

1o. Maple Sugar in Cakes, not less than ten pounds, 5 Prizes, $5, $4, $3, $2 and $1.

2o. Soft Sugar in pails, not less than 10 pounds, 4 Prizes, $4, $3, $2, and $1.

3o. Maple Syrup, not less than 2 gallons in glass, 6 Prizes, $10, $8, $6, $3, $2 and $1.

4o. Artistic Display of Sugar and Syrup made by the exhibitor, not less than 5 gallons of Syrup and 50 pounds of Sugar, 3 Prizes, $15, $10 and $5.

AT SHERBROOKE

1o. Producers' Display opened to goods produced by the exhibitor only. Not less than 5 gallons of Syrup and 50 lbs. of Sugar, 3 Prizes, $15, $10 and $5.

2o. Cake Sugar, not less than 10 lbs, 3 Prizes, $5, $4 and $3.

3o. Soft Sugar in jars or pails, not less than 20 lbs., 3 Prizes, $4, $3 and $2.

4o. Syrup, not less than 2 gallons in glass, 3 Prizes, $8, $5 and $4.

OPEN TO MANUFACTURERS

1o. Maple Sugar, not less than 50 lbs, 2 Prizes, $10 and $5.

2o. Maple Syrup, not less than 10 gallons, in glass, 2 Prizes, $10 and $5.

The work of our Association is now turned toward securing a better market for our members. The checking of the adulteration and the lowering of the tariff by the United States Government ought to tend towards enlarging the field of demand.

The Provincial Government has inaugurated the first day of July as "Maple Day", and has distributed throughout the breadth of Canada, from the Atlantic to the Pacific, and in England, 28,000 free samples of our products and pamphlets to advertise the same and make them known to the class of people who wish to buy a genuine article.

A syndicate has been formed in London, England, to handle maple goods and has secured, to start with, a capital of $10,000.00, which will be increased as the trade may demand.

The Dominion Government has promised to exhibit and advertise our maple sugar and syrup at the Panama Exhibition at San Francisco next year (1915).

With all this bright prospect before us we hope to be in a position to handle every bit of the products of our members' next sugar season.

The sugar schools opened last spring have done a great deal towards showing to the farmers in their respective localities the ways of making sugar, and two or three more will be located during the present year for next season's work.

Our membership is now over 400, but it looks small when we think that we have over 35,000 sugar makers in Quebec alone. We cannot impress too much upon you the importance of having a large membership, and hope you will strive to induce your neighbor to join us.

The report of the proceedings of the second annual meeting of our shareholders, held at Huntingdon last January, is being prepared and will be mailed as soon as ready.

Yours respectfully,

THE ASSOCIATION,

per JOS. H. LEFEBVRE,

Sec'y-Treas.,
Waterloo, Que.

ORANGE RUST ON RASPBERRY LEAVES

Editor, Journal of Agriculture:

ENCLOSED please find a few leaves of garden raspberries that have been turning that way the last two years.

What can I do with them and what is the cause?

J. W.

Stanstead, Que.

Ans.—The leaves of your garden raspberries are attacked by a fungus called the Orange Rust. Blackberries as well as raspberries are affected by this disease and are frequently seriously damaged. The affected leaves first turn yellowish, but finally become bright red with an abundant coating of the spores of the fungus. These spores are readily scattered by the wind, and may thus affect previously healthy plants.

A very important character of this fungus is this,—that the threads of the fungus live year after year in the affected plants, so that when once the plants become affected there is no remedy, or rather, the only remedy is to dig up and destroy infested plants as soon as they show symptoms of disease: no other plan will rid the plantation of Orange Rust.

Applications of Bordeaux as soon as the Orange Rust spores appear will prevent the spread of the disease to healthy plants, but a plant once attacked seldom or never recovers; it gradually loses vitality; which condition is shown by the number of weak canes that arise from it.

W. L.

THE FARM AND FARM CROPS

THE CAIRNSIDE PICNIC

ON July 1st the farmers of the Beauharnois District held their usual Dominion Day picnic in the mganificent maple grove of Mr. Robert Greig at Cairnside. Music was provided by the Ormstown brass band, and the ladies of the district spread the tables with characteristic liberality. There were races for the young people and grave addresses for the older ones. Among the speakers were Messrs. Jas. Morris, M.P., D. McCormick, K.C., and Robert Sellar, Prof. J. F. Snell of Macdonald College and the Revs. Sinclair of St. Louis de Gonzague, George Whillams of Georgetown and Stewart A. Woods of Riverfield. Mr. Morris apologized for the lack of addresses in the French language; the Hon. Honore Mercier was expected but had found it impossible to be present. Mr. Morris referred to the prosperity of the farmers of the district and to the power which they could exert in the affairs of the country by co-operation. Mr. McCormick briefly outlined the progress of the Dominion since Confederation, emphasizing the part which the transcontinental railways have played and are playing in the development of the West. Prof. Snell, the clergymen and Mr. Sellar urged the farmers to develop co-operation and to re-organize rural education in such a way as to emphasize training for agriculture and rural life. Mr. Sellar also referred to the scarcity of labour and predicted eventual relief through the use of electrical power on the farm. Of the greatest importance, in his opinion, was the preservation of the rural home. The highest type of home life was to be found in the farm homes of our country.

The day was a beautiful one and although, on account of the state of the roads, the attendance was smaller than usual, it was generally agreed that the picnic had again been a success and the holiday a profitable and enjoyable one.

Harrowing Roots before thinning. The harrowing not only reduces the stand where this is too thick, but it also produces a mulch both between the rows and between the plants in the row.

IN THE ROOT FIELD

A Conversation overheard

"YOU have got some splendid roots, John, and they certainly are big for this time of year, Man, but you must have a mascot to help you, or else you must have been born with all kinds of good luck".

—"Oh, I don't know about that. To be sure, Bill, if due allowance is only made for their requirements in regard to cultivation, plant food and time of seeding the roots very seldom fail. In fact, I count them as being one of my most reliable crops".

—"You don't say. As for me, I have found them to be just about as unreliable as everything else under the sun. This year, at home, the seed not even germinated, at least not in time. Most of it never came up until after the last rain, and under such conditions neither cultivation nor manure help very much. —I got started rather late with the seeding, and, do you believe me! the drills were just as dry as dust a couple of days after seeding, and much of the seed actually blew away in that terrific wind we had the first days of June".

—"Say, Bill, but you are a regular old timer. Now I begin to understand why you call the roots unreliable. You hauled the manure out this spring ?"

—"Well, yes, I didn't have time in the winter".

—"And you never harrowed the land, I suppose".

—Of course I did. Do you think I would seed without harrowing, as some farmers do? No sir, not for me. I don't believe in that method. I plowed down the manure, disced my land twice and harrowed and rolled it before drilling, and rolled it again before I started to seed."

—"Yes. But did you never touch it at all until close upon seeding time ? Did you not put on a light harrow as soon as the land could carry the horses?"

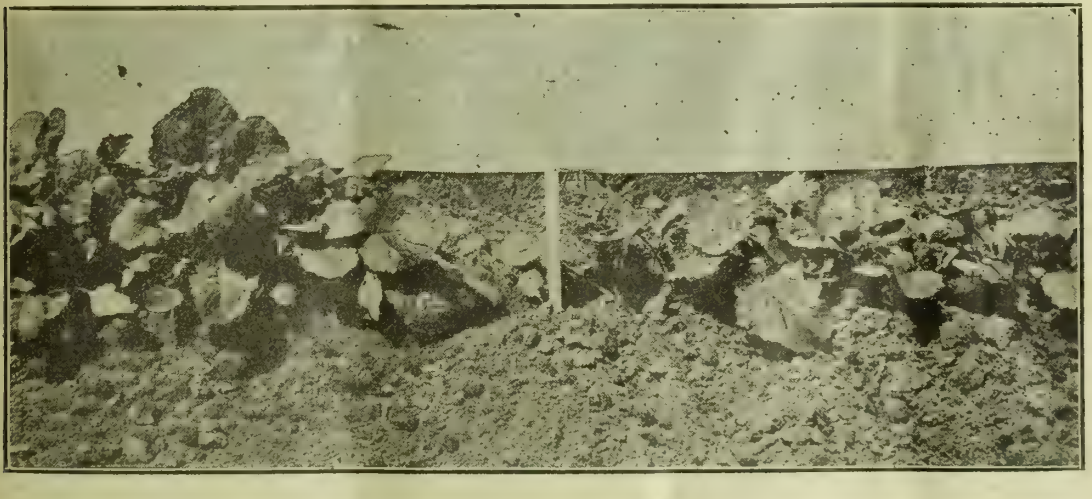
—Of course not. You can't jump over the whole farm at once. You have to do everything in turn. But say, John, what are you driving at ?

—"It is only this, Bill, and excuse me for saying so, that you have sinned against the first commandment in soil management, to wit: "Thou shalt not dry out thy land." — In the first place you omitted to give your land a stroke with a peg-tooth harrow early in spring, and consequently did not prevent the capillary and evaporative pumps from working at full speed from the very beginning of the season. Secondly, you plowed down manure in the spring which, you may be as careful as you like, always means loss of moisture. And, finally, you laid up the land in drills, increased the soil surface and consequently gave the evaporative pump an excellent lubrication. I will admit that it is advisable to use drills in exceptional cases, but as a rule the flat land method is better under our dry summer conditions. It at least saved my roots this year. By harrowing early in spring I prevented evaporation to a very great extent, and there was sufficient moisture in the ground at seeding time to ensure perfect germination of the seed. The roots got a good start, and after seeding I created a good surface mulch with the aid of a harrow".

—"Do you mean to say, that you actually harrowed the roots after seeding?"

—"Why, certainly. I not only harrowed them immediately after seeding, but I also gave them two strokes of the harrow across the rows before thinning. You can see the result on the swedes which have not yet been singled out to their proper distance. I use plenty of seed in order to get a good catch, and under favourable conditions there are of course far too many plants. However after the harrows have done their work thinning is mere play".

—"Well, judging from the results there must be something in your method. And I almost believe that I will try it next year".



Result of harrowing a close stand of swedes — four days after.
On the left it was not harrowed. Note too many plants, difficult to handle with the hoe.
On the right it was harrowed. Note right number of plants, easy to single by hand or with hoe.

—"All right, Bill, but don't forget to prepare and clean your land this fall by double ploughing and repeated topworking between the two ploughings."

P. A. BOVING.

NOTES ON THE CEREAL HUSBANDRY DEPARTMENT, MACDONALD COLLEGE, 1914

THE spring of 1914 at Macdonald College and in the immediate vicinity was a most peculiar one. For quite eight weeks, from the middle of April till the middle of June, no rain fell in sufficient quantity to be of any use to the crops. Such weather furnished excellent conditions for seeding but a poor opportunity for germination and growth. Largely as a result of these circumstances, problems have arisen which may well receive brief attention here.

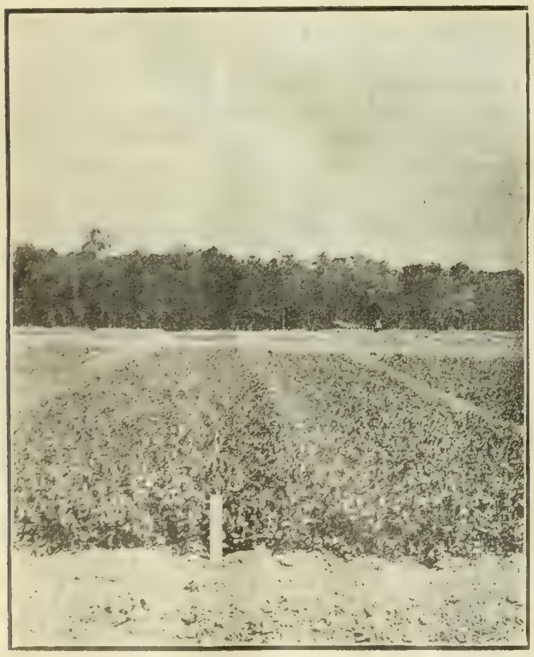
Necessity for Rolling or Packing:

The practise of rolling the land has been in vogue for a very long time. If it was for nothing else than to level the land, making it easier to harvest the crop, some form of roller was usually employed. While the roller is good for this purpose, it undoubtedly has a more important function in dry weather — that of inducing a better germination. This is brought about by a two-fold action — drawing the moisture from below and firming the soil about the seed.

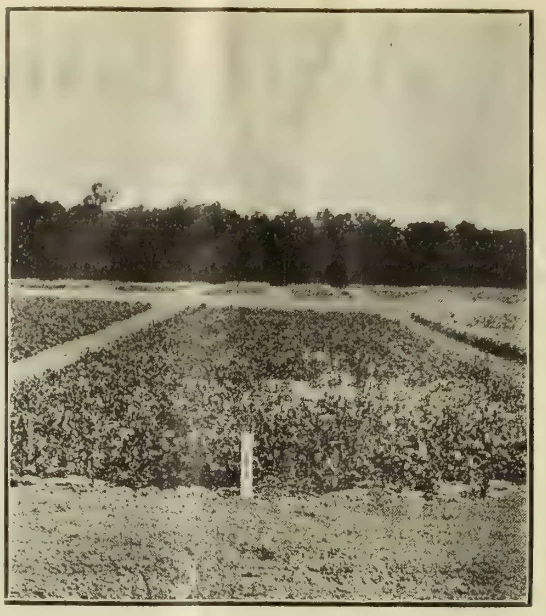
Better than the roller, however, is the soil packer. This consists of a series of heavy iron wheels set closely together to revolve on a central axle. This machine is in general use in the West and giving the best of satisfaction. If droughts continue to occur frequently in the East a soil packer and pulverizer will soon become a necessity.

Drilling vs. Broadcasting:

There are few men, who have ever had the experience, but will agree that drilled grain will almost invariably give better results than broadcasted. This is particularly marked with such grains as wheat and peas, which are extremely hard to cover when seeded broadcast. The reason for this fact is not far to seek. Drilled grain is placed down at a uniform depth and far enough below the surface to insure good moisture conditions. The vast superiority of the drilled is very well brought out in an experiment in the Cereal Department this year. The accompanying photographs bring out very clearly the very great difference in drilled vs. broadcast peas. One curious fact, which is very hard to explain, is that drilled grain will almost invariably give a higher percentage of smut than will broadcast. Under average conditions, however, there is no doubt as to the wisdom of drilling in small grains.



"Golden Vine" Peas, Drilled.



"Golden Vine" Peas, Broadcast

Dates of Seeding:

Just at this season of the year the experiments in Dates of Seeding furnish a very valuable object lesson. This year the first seeding was planted on the sixth of May and the last or sixth seeding, on June 10th. Thus each date of seeding is planted just one week later than the succeeding one. The plots now show very distinctly the great advantage which the early sown grain has over the late. Farmers generally should learn to appreciate this and aim to have their land ready early in the spring by following the practice of underdrainage and fall cultivation.

Peas:

Wherever one goes throughout the Province one finds a very general contention, held by some of the best farmers, that common field peas will not grow as well as they formerly did. It seems unfortunate that such an idea should exist with so little foundation in fact. From our experience in the Cereal Department this contention is not borne out. This year our stand of peas is as good as one could well wish for. Peas do best on a moderately rich loam. One of the best varieties under our conditions is the Prussian Blue. This has given the best yield as an average of a five years test.

Smut:

Few people appreciate to what an extent smut depletes the yield of the small grain crops, particularly in oats. Frequently one finds fields through the province in which at least 20% of the heads are smutted. The year of 1914 seems to be very favorable for the growth of this fungus.

The smut of oats, which is always the worst, is very easy to combat. A thorough treatment with Formalin (1 pint to forty gallons of water) will entirely rid the crop of this disease.

The smuts of barley and wheat are of an entirely different character and call for a different method of treatment.

It should be mentioned here that Success (beardless) barley which is recommended as a nurse crop for alfalfa is very subject to attacks of loose smut.

Catch of Clover Seed:

Contrary to what one might expect the catch of clover has been, for the most part, fairly good. Wherever the seed was put in early and the soil given proper preparation it has come along remarkably well in spite of the dry weather.

Last year's clover is in fair condition. In some of the more exposed locations it has been killed out more or less. The dry weather made conditions such that the cutting of hay was decidedly short. However, the first crop was taken off about a fortnight earlier than usual and since the rain has now come prospects are that the second crop will be decidedly heavier. Many people have made the mistake of allowing their first cutting to go so long that they not only spoiled the quality of the hay but seriously curtailed their chances of getting a second cutting. Clover, like alfalfa, must be cut at the right stage both for the sake of the hay and also for the succeeding crop.

Alfalfa:

Alfalfa has received more attention in the Cereal Department than any of the other forage crops. From eight to ten acres are devoted exclusively to the culture of alfalfa, either sown singly or in a mixture with grasses.

The miscellaneous collection of alfalfa numbering about eighty-eight strains still affords an excellent example of variation in hardiness. The feature of greatest interest is the outstanding hardiness of the rows of Grimm and strains of Grimm.

Experiments are being conducted to determine the best method of producing alfalfa seed. Looking to this end quite a large block has been seeded in rows. At date of writing prospects look good for a much heavier set of seed than on a similar broadcast area.

Owing to the general complaint that it is very hard to get a catch with alfalfa, some different mixtures are being experimented with. The most promising combination, up to date, is one of Orchard Grass, Tall Oat and Alfalfa. These two grasses are both very early in maturing and consequently mix well with alfalfa as they mature at the same time as the first cutting. Another distinct advantage of the mixture is that should the alfalfa become killed out we shall still have the grasses to fall back on for a crop.

Hardy conditions develop a hardy race. So it is with plants. Unless unfavorable conditions occur it is impossible to isolate the strongest plants. Frost, drought and disease save the experimentalist untold work with weak types and by a process of selection enable him to isolate the more fit.

L. C. RAYMOND.

IMPRESSIONS OF A TRIP THROUGH WESTERN ONTARIO

(First article)

TO persons interested in agriculture and its progress, nothing can be more encouraging than a trip through parts of Western Ontario. It was my good fortune to be able to make such a trip during the month of June and it was one from which much profit and pleasure were derived.

Like every other country, it has its faults, but since these "faults" are chiefly those which can be remedied by improved methods of farming, the outlook is indeed bright for the future welfare of that great "Garden of Canada".

The country visited was chiefly of two types, the one rolling, the other almost perfectly flat. The former class of land was seen north and west of Guelph, around Berlin and Waterloo, and near London and St. Thomas.

In the rolling country farming of the mixed type prevails. The frequency of the silo bore evidence of this. It was here that the best crops, out-buildings, barns, and houses were found, the latter being for the most part structures of modern type, comfortable in every way. In fact those communities where cattle were kept, either for production of milk or beef, and where the silo stood as the trademark of the farmers, seemed to be the most wealthy, properous, and up-to-date of all the farms seen.

One thing which was very noticeable in these districts, was the freedom of the fields from weeds of a serious nature. We need not look far for the reasons. The land for the most part bore eloquent testimony of intense cultivation, seen in the beautiful well-worked soil in which the grain was just nicely started. The other chief reason is the heavy pasturing of live stock which helps to exterminate the weeds.

These evidences of prosperity and progress coupled with the high condition of the land should encourage those in this province who are endeavouring to build up the dairy industry in our communities.

On the flat land a different class of farming is carried on in most sections. This applies chiefly to the district of Chatham where a great deal of corn is grown, the crop being as a rule either sold as grain or fed on the ear to the "money-raising" hog. Many of the farmers have eighty to ninety hogs feeding for the market, to which they are mostly sent alive.

This corn industry would seem to be one which would produce clean fields, but as a rule the fields are not nearly so clear of weeds or in so high a state of cultivation as where mixed farming is the rule.

Two or three probable reasons for this might be suggested. Firstly, the land is so fertile that the farmer is careless, since in most ordinary years he is sure of an average crop, even without cultivation. Secondly, there are no cattle to help in the subjection of the weeds. Thirdly, the land requires, in very many instances, drainage of an extensive character. The latter reason can be amplified by stating that very often rains may render the land so wet after the crop has been planted that cultivation cannot be attempted and so the weeds obtain a strong foothold.

The farmers are however mostly awake to some of the needs of the situation, especially the last, as is proven by the presence of perhaps a dozen ditching machines in that vicinity, all laying tile in order to provide a better outlet for the surface water and to lower the water table. The large tiles, about 7 in., cost $45 per 1000, while the machine works at a cost of 25 cts. per rod.

Another industry, steadily gaining ground among the farmers of that section, is the growing of sugar beets for sugar manufacturers. One of the largest factories in Canada is to be found at Wallaceburg. The company operating the factory keeps an expert who goes around visiting the farmers, advising them when and how to plant, how to thin, etc.

Some farmers make as much as $2,500 off a crop of beets in one season. Still another crop of importance is that of beans, which are grown in fields of twenty-five acres and upwards.

The growing of this class of crops cannot help but be hard on the land, and probably more mixed farming will be taken up as the necessity for it grows more apparent. Drainage and mixed farming will surely work wonders in what is even now a wonderful country, full of possibilities.

Orchards of medium size are abundant in both sections mentioned, and the development of the fruit industry in some districts promises to be a large one, for conditions are very suitable. One pest of which we have heard so much and seen so little has ravaged the orchards of Kent county. We refer to the work of the much dreaded San José scale; whole orchards stand dead to-day as results of their work. It is almost too late now to save the situation in some of the affected districts, but intelligent spraying would have exterminated it in the beginning. There are orchards to-day surrounded by the scale, which having been intelligently sprayed, are free of the dread pest. This fact only serves to add another strong link to the chain of evidence with regard to the efficiency of spraying.

Space will not permit of discussing the crops at any further length, but even at the risk of being irksome we must restate that silos, mixed farming and prosperity seem strongly linked together.

The public conveniences of the farmer are many and efficient. Practically all the farmers have the phone, and a section without rural mail delivery is the exception. These two advantages, coupled with good train or trolley service to the large towns found so plentifully in Ontario, serve to make farm life much more profitable and enjoyable. The coming of the hydro-electric power to the farms is also serving as a great factor in solving the labour problem, and thus lightening the burdens of the farmer and his family.

Very many of the rural schools are of the highest type, well furnished and comfortable, carrying on work for the betterment of the community.

There are some of these schools undertaking the teaching of Agriculture in the school by means of the school garden and the teaching of lessons along agricultural lines in the class room. These efforts are being attended with no small measure of success and merit an article by themselves, so they will not be dealt with at present.

No attempt has been made to outline any of the more detailed incidents of the visit, but an effort has been made to show in a very general way the impressions which were received in making a hurried trip through the sections just described, and also to show that Ontario and its possibilities are just about as great as its inhabitants say they are,—and that is very great indeed.

J. E. M.

AMONG THE HOWICK AYRSHIRE BREEDERS

A Visit to Some of the Farms of a Famous Breeding Centre

THE neighbourhood of Howick in the county of Chateauguay has a continental and almost world-wide fame as an Ayrshire breeding centre. The original settlers were of Scottish origin and their natural preference for the cattle of their native land has found full justification in the adaptability of the Ayrshire breed to Canadian conditions. The Ayrshire breed has taken strong root in the soil of Western Quebec and Eastern Ontario, and although Howick has now to compete with other important centres of breeding, its fame as the home of high-class stock has by no means faded with the lapse of time.

The Ness Farms.—The name of Ness is the most famous among those of Howick breeders of Ayrshires. The family reputation established by Mr. Robert Ness, sr., has been well sustained at home by the sons, R. R. Ness and D. T. Ness, and in other parts of this continent by other sons. A representative of the Journal was the guest of Mr. R. R. Ness at Burnside Farm for a day at the beginning of July and had the pleasure of a drive through the neighbourhood with this genial prince of Ayrshiremen, who, with characteristic generosity, showed the journalist more of the good things on his neighbours' farms than of those on his own. The Burnside farm was the gold medal farm of the 1906 Agricultural Merit Competition, and also the winner of the great Farm and Dairy competition open to Ontario and Quebec. The farm itself comprises 180 acres, although Mr. Ness works more than that area. It is very regularly divided, each field comprising twenty acres. A regular rotation of crops is followed, the large area in corn each year being a conspicuous feature. Mr. Ness's great live stock interests render the growing of feed the great object of his farm management, and everything is directed towards that end. Ensilage plays a prominent part in the ration and roots and commercial feeding stuffs are used to a considerable extent.

Both in his cow stables, built several years ago, and in his new horse stable, Mr. Ness has the animals in two rows facing one another with liberal space allowance between them for feeding purposes, and equally liberal space behind each row. This provides ample air and not only facilitates working both in front of and behind the animals but also provides for the comfortable passing of visitors through the stables. Good light is obtained upon the back parts of the beasts. Ventilation is provided by air shafts 4 ft. square running up to cupolas at the top of the buildings. Doors into these ventilating shafts in the lofts permit of their being used also as hay chutes. No litter carriers are used, as Mr. Ness prefers to remove the manure by driving through the stable with a cart or sleigh — a point upon which he differs from the majority of his neighbours, who, we noticed, were supplied with litter carriers. Mr. Ness ships his milk to a Montreal company.

At the head of the Burnside herd is the magnificient four-year-old bull, Hobsland Masterpiece (Imp. 8795 - 36717) — well known to all our exhibition visitors of recent years. In the stable we noticed a number of the cows Mr. Ness is preparing for the show ring this fall. Among them were Auchenbrain Fanny, the Ottawa champion of last year; Beulah Spottie and Broomhill Flora; the three-year-olds, Burnside Denty and Burnside Maggie, and the two-year-old, Burnside Lucky Girl. A number of calves of similar high quality are being fitted for exhibition.

Mr. R. R. Ness's Farm Buildings.

Group of Ayrshires on Burnside Stock Farm, Howick, Que.

Mr. D. T. Ness has a farm of less than one hundred acres on the opposite side of the road from the Burnside farm. Towards the front of the farm is a stony ridge upon which the original forest has been very wisely allowed to stand. This forms an excellent little sugar-bush of about four hundred trees. The head of Mr. D. T. Ness's herd is White Heather. Mr. Ness is remodelling his cattle stable and erecting a new horse stable.

Mr. Albert Ness, whose farm adjoins that of Mr. R. R. Ness, also keeps Ayrshires, but, as is well-known, horse breeding is his specialty. His partner in the horse business, Mr. Robert Ness, sr., was in Scotland at the time of our visit selecting stock for their annual importation. Sir Spencer, the well-known Clydesdale stallion, is as vigorous as ever. Up to July first he had served about 100 mares. His record last year was 125 mares, yielding over 100 colts. At the time of our visit there were mares in the stable from as distant a point as Magog.

In addition to Sir Spencer, two other Clydesdale stallions are being used in the Ness stables this year — the four-year-old Bladnock by Everlasting, dam by Montrove Ronald, and the three-year-old Bombie Pride by Mendel, dam by Baron's Pride. The handsome Standard-bred Prince Parlan, which won the carriage championship at the Ormstown Spring Show, is also standing for service.

Stonehouse Stock Farm.—Mr. Hector Gordon is reputed to be one of the best farmers of the district, and his prominence in the show ring is well-established. His farm, comprising 188 acres is worked upon the six-year rotation commonly followed in the district, viz., (1) hoed crops, (2) grain, (3) clover, (4) timothy, (5) pasture, (6) pasture. His grain and hay crops were conspicuously good at the time of our visit. He has a herd of sixty Ayrshires. The present herd of the herd is the yearling Netherhall Lochinvar by Torr's Annual, dam Torr's Lochmaben, but most of the young stuff of the herd is from the bull White Heather, now owned by Mr. D. T. Ness. Mr. Gordon is handicapped by the lack of modern stables, but we understand that he contemplates rebuilding in the near future.

Sunnyside Stock Farm.—Sunnyside Stock Farm on the right bank of the Chateauguay river, between Allan's Corner and La Fourche d'Howick, has won a silver medal in the Agricultural Merit competitions of 1906 and 1911. In the former year the farm was still owned by the late Mr. William Logan. In 1911 it was the property of his son, the present owner, Mr. John W. Logan, who has combined it with his own farm, also a silver medal farm in the competition of 1901. This repeated success in the Agricultural Merit competitions is indicative of the perseverance of the Logan family in good farming. The combined farms cover 250 acres of land, upon which are kept 50 to 60 head of pure-bred Ayrshires. Winter dairying is practised, the number of cows in milk in the height of the season being about thirty. Mr. Logan separates his milk and finds the sale of cream in Montreal more profitable than the shipping of milk. His stock bull is the five-year-old Netherhall Sir Douglas, imp., winner of the championship at Sherbrooke, both as a two and as a three-year-old, and of that at Ormstown as a three-year-old. Among the famous cows of the Sunnyside herd are Ardyne Kintyre, winner of the two championships and the dairy test at Sherbrooke and of several first prizes for cow and two of her progeny, and Morton Mains Belle, last year's champion at Sherbrooke.

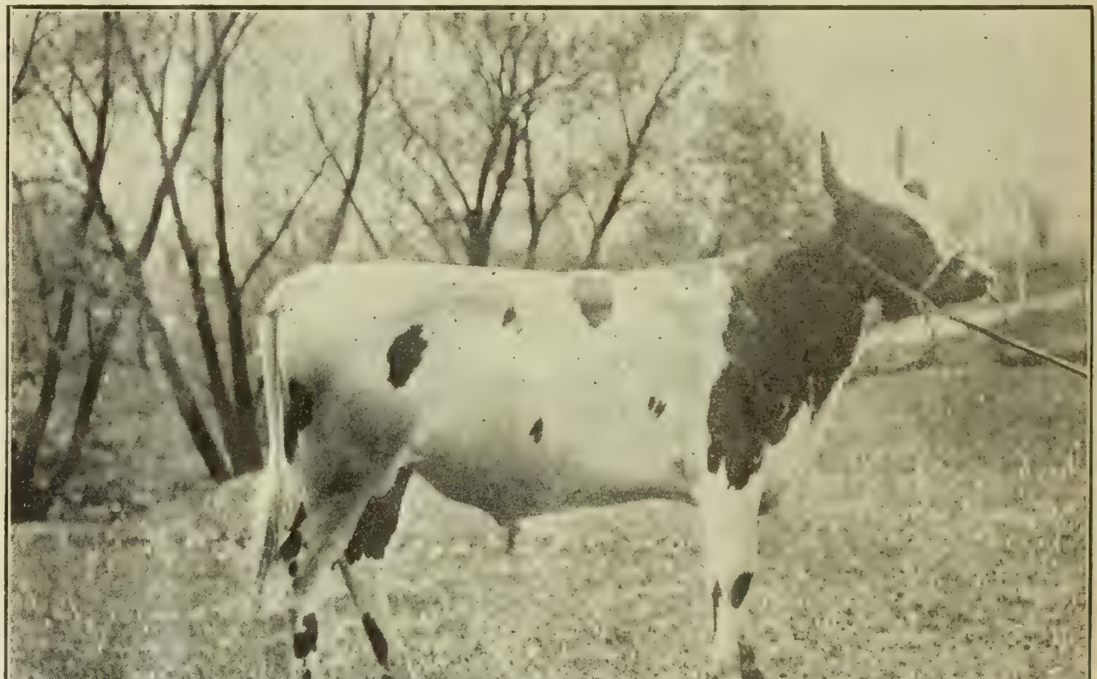
Mr. Logan's remodelled farm house deserves an article by itself. In the report of the Agricultural Merit judges for 1911 it is recorded that "Mr. Logan's house is not in accordance with the fashion of the day, but is nevertheless of pleasing appearance and provided with all that can procure comfort to its inmates". Since that report was made the house has been enlarged, thoroughly modernized and made even more comfortable than it was then reported to be.

Cherrybank Stock Farm.—Although a comparatively young man, Mr. P. D. McArthur has attained an enviable standing among the Ayrshire breeders of the country. His farm of 135 acres carries a herd of fifty or more, headed by the excellent four-year-old bull, Whitehill Free Trader, by Whitehill Envy Me, dam Whitehill Mary. He has also a strong two-year-old bull in White Chieftain of Cottage Hill, sired by Auchenbrain Albert. Among his tested cows is Buttercup with a daily record of 76 lbs. of milk.

Mr. McArthur has nearly completed a new stable, 100 x 42 feet, arranged like that of Mr. R. R. Ness with the two rows of cattle facing and with roomy passages between and behind. Mr. McArthur is departing from the custom of the majority of his neighbours in dispensing with drinking cups for the cattle. He uses the same trough for feed and water.

Terrace Bank Farm.—Mr. J. D. Duncan is well-known as a large scale milk dealer in Montreal as well as in the capacity of farmer and breeder. His farm, known as the Terrace Bank Farm, stood first among the silver medal farms in the competition of 1906 and third among the competitors for the gold medal in 1911. This farm of 160 acres carries a herd of 66 Ayrshires. Of the 28 cows milking at the time of our visit, 18 had recently been tested. The herd of eighteen showed an average of 4.9 per cent of milk fat, only one cow falling below 4.1, while one showed a fat content of no less than 5.6 per cent. Mr. Duncan has imported about 100 head during the last three years. About 45 of his cows have been bred to Mr. P. D. McArthur's bull, Jupiter of Hickory Hill.

Elm Grove Farm. The farm of Mr. James McKell and Son of Riverfield offers rather more diversity of products than that of the majority of



White Chieftain of Cottage Hill, — 33872 — Property of Mr. P. D. McArthur, Howick, Que. Several cows by the same sire have qualified with over 5 per cent of butter fat.

LIVE STOCK

FLIES IN THE STABLE

It is not difficult to keep a stable free from flies. Many a tired horse is brought to his meals and tied in a stable swarming with flies, and has to take his food as best he can while his main energies are devoted to fighting off his tormentors. Horses fed under such conditions cannot thrive well. They not only waste their food, but there has been a great waste of energy as well in fighting their tormentors. In order to keep flies out of a stable it is only necessary to put on fly screens or mosquito netting over the windows and doors. When the horses are taken out in the morning a dark blind of some sort should be drawn over each window and the doors shut, which will ensure darkness. A couple of pails of water sprinkled on the floor in the morning will create a moisture which is also objectionable to flies and which will tend to keep the stable cool. A horse brought in to dinner in a stable such as this will enjoy his food. It will do him more good, and he will have had at least one hour of the day free from the tormenting flies. While at work fly nets or sheets should be used. The nets are better, the sheets being somewhat hot. Most horses are much irritated by gadflies striking them in the region of the throat and between the arms of the lower jaw. A piece of cloth tied from the throat latch extending downwards and fastened to the lower outside of the bridle or bit will protect the parts very effectually from the attacks of this fly. Any method that a farmer can adapt to afford protection to his stock during the fly season will amply repay him for his trouble.

SHEEP-KILLING DOGS

Sir :—

I would like to say a few words on the much discussed question of sheep-killing dogs. To my mind a good dog is as valuable as any animal on the farm. I like the black and tan collie trained to obedience from youth. The buff collies are too sensitive for ordinary mortals to handle. If farmers would castrate their male puppies it would in a great neasure prevent banding, which is a sure cause of the sheep-killing habit. I have never known a lone dog to kill sheep. I have a woolly dog which delights to be with the sheep; acts as a protector and will allow no scrapping among any of the stock on the farm. I have been handling sheep all my life. At present I have a flock that averages 12 lbs. of wool to the fleece; have 25 lambs from 14 sheep thus far and more to hear from. I had one set of triplets that weighed when born 27 lbs. I keep a few small team bells on my sheep, one to every 4 or 5 sheep and have never known them to be even chased by dogs.

R. W. FINDLAY, Danville, Quebec.

(Census Monthly)

GREEN CROPS FOR SHEEP AND LAMBS

Save the Pasture.—Increase the Earning Powers of the Farm

Midsummer is here. The spring pastures which sprang forth so luxuriantly are now beginning to show signs of the continued grazing of stock. The hilly and more barren parts are already closely cropped and in some places browned with the sun. In a month or six weeks if the usual hot dry summer weather prevails, a shortage of pasture will be general, especially on those farms that are stocked up to their full capacity.

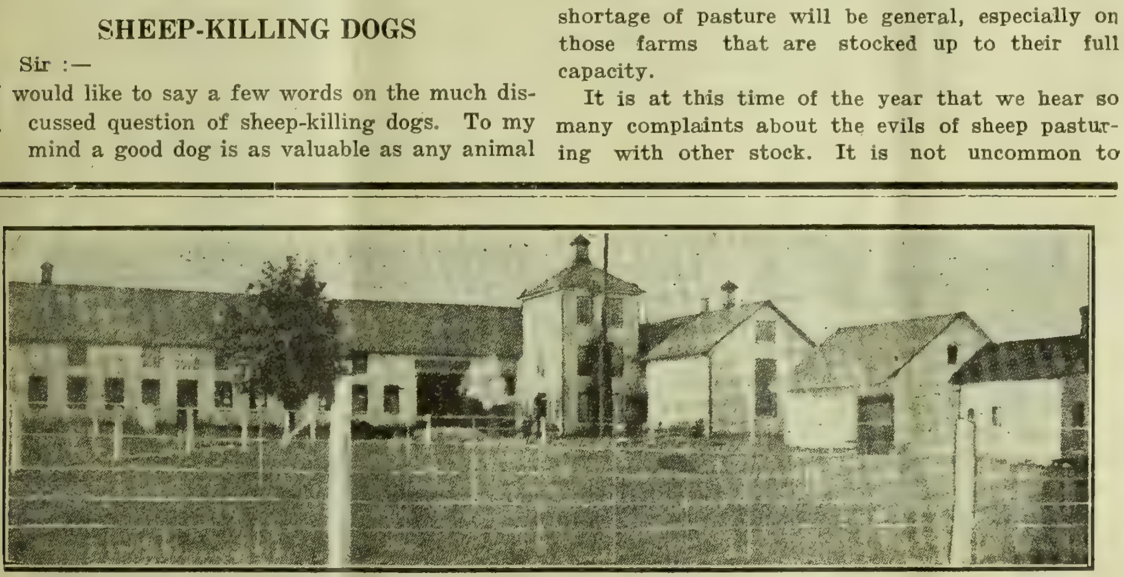
It is at this time of the year that we hear so many complaints about the evils of sheep pasturing with other stock. It is not uncommon to hear a group of farmers say that "you can chase a louse over a sheep pasture in August", and in driving through the country one has to admit that pastures are often very scanty where sheep are grazing with a herd of dairy cows or other stock. Yet when you come to analyse the situation, in all probability the farmer who pastures twelve ewes and as many lambs with his other stock has not allowed an acre more than his neighbor who does not keep sheep. There can only be one result where such is the case. Go out into such a pasture early in the morning and the sheep and lambs are busy at work. They will bite twice or three times while the other stock are getting one mouthful. They are to be found feeding on the shorter herbage, and if you take the trouble to examine the part of the pasture that they have grazed over it will be cropped very short. Go again to where the cows or horses have been feeding and they will have taken only the stronger part of the plants, leaving that part which the sheep relishes most. This would indicate that the most economical returns are got from a pasture where sheep are kept with other stock, especially where sufficient area is allowed for both. In the summer season however, when the pastures make slow growth there is no doubt that the sheep has every advantage over other classes of stock both on account of its activity and on account of its close-grazing habits.

This being the case some provision should be made whereby sheep and lambs can be removed, part of the time at least, from pastures where other stock are grazing. As already indicated sheep show a decided preference for fresh green herbage, and this has led to the practice of sowing green crops for use during the late summer and fall months when other pastures are short. These crops must be rapid growers and furnish a crop of green foliage of a highly nutritious nature. A number of such crops are recommended, including rape, vetch, peas, oats, rye, fall turnips, cabbage, clover and alfalfa.

Rape is perhaps the most widely used, being a rapid grower and much relished. It may be seeded with the spring crop between the rows of corn or separately. When sown with barley or oats it is sometimes troublesome at harvest time, as in a favorable season the leaves are cut and bound with the other grain thus delaying harvesting. Perhaps the better way, especially with barley, is to disc immediately after harvesting and reseed to rape. Oats are usually harvested too late for this practice. When seeded between the rows of corn the seed may be sown just previous to the last cultivation. As soon as the corn is harvested the rape will make rapid growth providing abundance of fall pasture, with a tendency to keep down weeds.

Aside from these crops rape may be seeded alone either in drills or broadcast, the usual time of seeding being from April until the middle of July. By seeding on different dates a succession of crops may be secured for use over a long period. Rape is usually ready for pasture in eight to ten weeks after seeding. When sown broadcast from 6 to 8 lbs. of seed per acre is required. When sown in drills twenty-eight to thirty inches apart 2 lbs. is sufficient. Seeding in drills gives an opportunity for cultivation which is often valuable in cleaning up a dirty piece of ground. Rape grown in drills is much stronger in growth and the rows provide a path for grazing, thus eliminating to a certain extent loss from tramping. On the other hand, rape grown broadcast is perhaps more tender, especially for lambs, and less labor is required.

Care must be taken in getting sheep accustomed to rape. The afternoon is the best time to



Mr. J. Duncan's barns.

the Ayrshire breeders of the Howick group. In addition to pure-bred Ayrshires and their milk, the Messrs. McKell sell steers, hogs, poultry, maple syrup and sugar, and even hay and grain. Their farming is on a larger scale than that of the other Ayrshires breeders. The farm comprises 400 acres, 300 being under cultivation. Last year they threshed 2000 bushels of grain, their wheat crop yielding 25 bushels to the acre. They sold 1000 bushels of oats and 50 tons of hay. This year their 1300 maple trees have yielded 420 gallons of syrup. In the Agricultural Merit competition of 1911, this farm stood fifth among the winners of the silver medal.

Other breeders upon whom we were able to make only the briefest call are Mr. William Brown, who has a herd of about 25 Ayrshires, and the Macfarlanes, father and two sons, who are noted for the general excellence of their farming. Mr. D. Macfarlane has a model stable, abundantly lighted and thoroughly ventilated. His stables have over them only a small loft, which is used for cut straw. The hay is kept in a barn adjoining the stables. The feeding alley between the two rows of cattle is five feet wide and there is a space of seven feet behind each row. The intake ventilation shafts open in the feeding alley at a height of about four feet from the floor. The ventilating outlet is partly through the ceiling, partly through the silo room.

One notes with pleasure the feeling of good-fellowship and neighborliness which exists among the Ayrshiremen at Howick. They appear to be ever ready to help one another. And judging from the general appearance of prosperity among them, there can be no doubt that this kind of good-hearted co-operation is of financial advantage to them. They are not only happier but also more prosperous on account of the absence of petty jealousies.

J. F. S.

A GROUP OF EASTERN TOWNSHIP SHEEP.
(Photo by courtesy of "The Sherbrooke Record").

drive sheep or lambs into a rape field as then they are not so hungry as early in the morning. Sheep and lambs are subject to bloat if turned into a rape field after a rain or early in the morning. Severe frosts are also likely to set up acute indigestion. The best results are obtained from feeding rape in conjunction with a good pasture field.

Vetches are healthy for sheep and provide a variety. Oats and peas are especially valuable for sheep either as a pasture or for green feed. Rye may be used for early spring or late fall pasture. Fall turnips have much the same value as rape and may be sown either in drills or broadcast.

Cabbage is especially relished by sheep and affords a large amount of the best feed. Owing to scarcity of labor this crop is not likely to be cultivated except in a small way.

Clover and alfalfa make excellent supplements to other pastures and are highly nutritious.

There are always a few acres around every farm that can easily be utilized for the growing of green crops. Many of our fields are overgrown with weeds in the fall which could be profitably producing a green crop for sheep, thereby increasing the earning power of the farm and at the same time maintaining the fertility of the soil. Many farmers under present conditions are forced to sell their lambs early in September owing to shortage of pasture, whereas a little foresight and outlay would enable them to carry their lambs over for the top price. Now is the time to take steps to avert this difficulty.

A. A. MacMILLAN.

THE DAIRY SHORT-HORN IN CANADA

(An Address by Prof. G. E. Day at the Guelph Winter Fair last winter)

ANY person who has visited England and has studied at first hand the live stock and the methods of farming in that country, will very readily admit that there is such a thing as a Dairy Short-horn, because we find more Short-horns than anything else in the dairy herds of that country. The largest dairy herd which I visited in England belongs to Messrs. J. & H. Robinson, in Sussex. These people have a contract to supply the city of Brighton with five hundred gallons of milk per day, and they have nothing but Short-horn cattle in their herd. Of course, they are not all pedigreed cattle, but they are essentially Short-horns. In fact it is rather an exception to see anything but Short-horn cattle on English dairy farms. Such being the case, there is no room to doubt that there is such a thing as a Dairy Short-horn.

ITS ORIGIN

It is rather interesting to study the origin of the Dairy Short-horn. Many of them are what we call "short pedigreed" cattle, that is to say, the first recorded cow has been admitted to registration since Volume 40 of Coate's Herd Book was published. Many of the largest producers belong to this class, and of course, according to the rules of the Dominion Short-horn Herd Book, they are not eligible for registration in our Herd Book. A purchaser of Dairy Short-horns, therefore, must be on his guard, and will find that he must leave behind many excellent cows if he wishes to record his cattle in the Canadian or Amrican Short-horn Herd Books. Many Dairy Short-horns, however, and many excellent producers, have as long pedigrees as any Short-horn cattle in existence, and it is very interesting to note that the most popular Short-horn cattle among English breeders of Dairy Short-horns almost invariably trace to the herd of Thomas Bates. It is a remarkable fact that the milking qualities so highly prized by Thomas Bates and scoffed at by many of his rivals should, after all these years, come once more to the front and make Bates's cattle the most popular cattle in England to-day. In many of the dairy families we find cows to-day of practically straight Bates breeding, and it seems somewhat strange to see wealthy men again spending money lavishly to secure representatives of some of these old, old tribes such as the Barrington, Cambridge Rose, Darlington, Duchess, Furbelow, Foggathorpe, Oxford, Waterloo, Wild Eyes, and many others whose fame for years was apparently obscured, but which has once more come to the front.

ITS APPEARANCE

In appearance the Dairy Short-horn is likely to disappoint those who are familiar only with the beef type. People are apt to forget that a deep-milking cow will usually become thin before the end of her milking period, and they expect a heavy milker to look like a cow that does not give enough milk to properly nourish her calf. All cattle which are very thin look very much alike so far as conformation is concerned. You may take one of the fattest and smoothest cattle in any show and allow it to become very thin, and you will be surprised how angular it will become; how the broad back becomes narrow and sharp, and the wide shoulder top contracts to less than half of its present width, how the full neck vein will shrink and disappear and thus add to the length of the neck, and how the animal will approach in general angularity of appearance to the conformation of the dairy cow. The casual observer, therefore, is liable to jump to the conclusion that the Dairy Short-horn is an undesirable type of Short-horn simply because he sees her shorn largely of the fat which covers up and smoothes over the angularities of her beef sister. If we were to take one of these same angular and thin cows, allow her to go dry and feed her liberally, we should be surprised to see how closely, after all, she would eventually approach the beef type. Generally speaking, however, there is a difference between the general type of the Dairy Short-horn and that of the approved beef type in Short-horn cattle. The Dairy Short-horn is usually a little longer in the face, a little longer in the neck, slightly longer in the leg, and rather more angular in her general conformation than the approved beef standard would permit. In other words, she is a little more nearly like the old-fashioned Bates cattle than the present Scotch type. While this is true, no person can deny that the old-fashioned Bates cow was an extremely useful animal for beef purposes in spite of the fact that she did not exactly conform to the ideal beef form as we regard it to-day.

RECORDS

Unfortunately, I have been unable to procure any satisfactory records regarding the steers from Dairy Short-horn cows, though it has been my privilege to see quite a number of steers which the purchaser of feeders in this country would be delighted to secure, although they might not make show animals. As to milk production, it is easier to obtain records, though even this side of the question has been more or less neglected in some herds. Being what we call a "dual purpose" breed, we would not expect to find any world's records in this breed, but we would naturally expect to find such records as would qualify the breed to be classed as a profitable dairy breed. Of individual cow records, one of the best, if not the best, is that of the cow known as Darlington Cranford 5th. Her highest yearly record was 12,567 lbs., a record which has been beaten by a number of other cows for the best one year's production, but this remarkable cow produced over 100,000 pounds of milk in ten consecutive years, a record which places her among the really high-class dairy cows. The Tring Park herd of Short-horns, owned by Lord Rothschild, is one of the prominent herds in England to-day, and in this herd very careful records are kept of each cow's production. The latest yearly record for this herd which I have been able to secure is that for the year 1911. In that year 74 Short-horn cows were in the herd during the whole year, and their records and averages are given apart from those which were in the herd only for a portion of the year. The highest record was made by a cow called Dorothy, which produced 12,851 pounds of milk, and the average yearly record of the 74 cows was 6,058 pounds per cow. When we consider the number of cows included in this test, we must admit that it is a fairly good showing even from a dairy standpoint. The cow Dorothy previously mentioned has an average yearly production of 9,722 pounds of milk for eight years. Another cow has an average record for seven years of 8,675 pounds per year, and still another cow has an average record for eleven years of 7,124 pounds of milk per annum. It would be possible to go on and give records of many other herds, some of which are considerably higher than the ones just mentioned. For example, in the herd of the late George Taylor there were 32 cows which averaged over 10,000 pounds of milk each per annum, a record of which any dairy breed might be proud, but perhaps enough has been said to give an idea of the possibilities of the Short-horn as a dairy cow, and the persistence with which the tenant farmers in England appear to cling to this breed is pretty conclusive evidence of its utility.

HAS IT A PLACE IN CANADA ?

We have discussed the Dairy Short-horn from various points of view, but there is still one other point to be considered, and that is : "Is there a place in Canadian agriculture for a cow of this kind ?" It seems to me that she probably does not come directly into competition for public favor with the recognized dairy breeds, for the reason that the Dairy Short-horn is not regarded as a special dairy breed, and consequently cannot be reasonably expected to give us a maximum production of milk or butter. While this is true, there are many farmers in this country who do not wish, or who do not find it practicable to make a specialty of dairying, and it is to this class of farmers that the Dairy Short-horn will especially appeal, for the reason that she will pay her way in milk and produce a calf which it is profitable to raise for beef purposes.

The greatest difficulty in the way of the spread of Dairy Short-horns is their comparative scarcity. It is true that they exist in rather large numbers in England, but the demand from other countries as well as the demand at home far exceeds the supply, and the result is that these cattle cannot be bought in England to-day for what they are worth. Such being the case, a person will naturally ask: "How then is the Dairy Short-horn to find a place in Canada if it cannot be bought for what it is worth ?" It seems to me that, in the meantime at least, there is only one thing to do, and that is to make the best of what we have. There are many excellent milking Short-horns in this country already if they could only be sifted out and have their merit recognized.

NOT CONFINED TO BATES STRAIN

I have mentioned the fact that Bates blood is very popular among the breeders of Dairy Short-horns in England, but deep milking qualities are not confined to cattle of this breeding by any means, and it is possible to find cows of practically straight Scotch breeding which make profitable dairy cows if the owner saw fit to develop them along that line. A few years ago the College owned an imported Scotch bred cow belonging to the Roan Lady family. This cow nursed her first two calves, which every person will admit was very bad training for a heifer in the way of developing her milking qualities. With her third calf she was milked, and a record kept of her production. In the year she produced over 6,000 lbs. of milk, and there is little doubt that if this cow had been milked from the start she would have made a really profitable dairy cow. This is only one case, but cows of this kind are numerous throughout Ontario if we would only take the trouble to find them out.

It will no doubt take years to bring the Dairy Short-horn into prominence in this country, especially since it is difficult to make importations at a reasonable cost, but the persistent use of sires from deep-milking dams and the careful selection of breeding stock will work wonders in the development of dairy qualities in the Short-horn cattle in this country. What will be the ultimate position taken by the Dairy Short-horn in this country remains to be seen, but the breeders of Short-horn cattle have it in their power to develop a dual-purpose breed of great possibilities provided they see fit to do so. The whole matter now rests in the hands of the Short-horn breeders.

OFFICIAL RECORDS OF HOLSTEIN-FRIESIAN COWS

From June 15th, to June 30th, 1914

No. and Name of Cow	AGE y.m.d.	Milk Lbs.	Fat Lbs.	Butter Lbs 80% Fat	OWNER
MATURE CLASS					
1. Inka Mercedes DeKol 6th 12249	5 2 19	535.2	21.16	26.45	J. W. Richardson, Caledonia, Ont.
2. Patricia 2nd 3970	12 2 4	607.	18.91	23.64	Geo. E. Sherwood, Brockville, Ont.
3. Oakland Queen 17144	8 11 17	703.9	18.78	23.47	
Twenty-one day record	8 11 17	2064.	54.36	67.95	Dr.L.de L. Harwood,Vaudreuil,Que.
4. Pearl Lilliedale 14686	5 5 13	487.5	18.45	23.06	W. W. Brown, Lyn, Ont.
5. Alberta Teaks 8658	7 1 1	478.1	15.13	18.92	J. H. Chalk, Calton, Ont.
6. Tolsti Goheen 12087	5 3 25	538.2	14.35	17.93	J. H. Chalk, Calton, Ont.
7. Cobequid Orne Belle 13144	5 8 25	453.0	14.04	17.55	Colony Farm, Essondale, B.C.
8. Madam Posch Pauline 10291.					
Thirty-day record	5 11 8	2937.3	94.26	117.82	
120 day record	5 11 8	12479.1	406.39	507.98	Colony Farm, Coquitlam, B.C.
9. Boon Homestead Burke 26257.					
Twenty-one-day record	6 4 15	1796.	65.63	82.04	Dr.L.de L. Harwood,Vaudreuil,Que.
SENIOR FOUR YEAR OLD CLASS					
1. Lulu Posch Rose 16509	4 11 26	435.0	21.46	26.83	W. E. Mason, Simcoe, Ont.
2. Johanna Hengerveld Jewel 15029	4 8 5	451.2	15.59	19.49	W. W. Brown, Lyn, Ont.
3. Oakvale Elsie Johanna 18027 ..					
Thirty-day record	4 7 27	2595.	92.07	115.09	Dr.L.de L. Harwood,Vaudreuil,Que.
JUNIOR FOUR YEAR OLD CLASS					
1. Beauty Tensen 15713	4 0 24	480.8	15.79	19.74	W. H. Mason, Simcoe, Ont.
2. Madolyn Netherland DeKol 27703	4 0 23	386.5	13.48	16.85	J. H. Chalk, Calton, Ont.
3. Lizzie Wayne Sarcastic 15399 ..	4 3 28	435.4	13.40	16.76	D. Caughell, St. Thomas, Ont.
4. Zarilda Clothilde 3rd DeKol 14887. Thirty-day record	4 2 2	3301.1	91.20	114.0	
Sixty-day record	4 2 2	6605.9	183.23	229.0	Colony Farm, Essondale, B.C.
SENIOR THREE YEAR OLD CLASS					
1. Aggie Johanna 16138	3 11 1	474.6	13.29	16.62	D. Caughell, St. Thomas, Ont.
2. Ina Woodcrest Pietje 26259 .. .					
Thirty-day record	3 11 20	2060.	60.99	76.24	Dr.L.de L. Harwood,Vaudreuil,Que.
JUNIOR THREE YEAR OLD CLASS					
1. Woodcrest Cornelia Pietje 26146	3 1 17	382.1	20.28	25.35	
Fourteen-day record	3 1 17	775.2	39.42	49.28	A. C. Hardy, Brockville, Ont.
2. Princess Stella Segis 17539 ..	3 0 9	374.	16.11	20.14	A. C. Hardy, Brockville, Ont.
3. Woodcrest Ormsby DeKol 18322	3 4 20	542.5	15.16	17.95	J. H. Chalk, Calton, Ont.
4. Princess of Wellesley 2nd 20167	3 1 11	422.0	13.29	16.61	
Fourteen-day record	3 1 11	824.	25.45	31.81	N.H. McConkey,Straffordville, Ont.
5. Elmwood Pontiac Mina 17409.	3 1 27	426.3	13.25	16.56	
Fourteen-day record	3 1 27	812.	25.29	31.61	N.H. McConkey,Straffordville, Ont.
6. Netherland Beauty Sophia 24025	3 0 6	353.1	11.82	14.77	
Fourteen-day record	3 0 6	701.	23.14	27.93	N.H. McConkey,Straffordville, Ont.
7. Lassie Ormsby 18321	3 4 9	303.2	11.26	14.08	J. H. Chalk, Calton, Ont.
SENIOR TWO YEAR OLD CLASS					
1. Sara Jewel Hengerveld 2nd C. 20928	2 10 28	334.4.	12.72	15.91	
Thirty-day record	2 10 28	1331.1	49.92	62.40	W. W. Brown, Lyn, Ont.
2. Mary Dorliska 18820	2 11 12	314.7	10.03	12.54	D. Caughell, St. Thomas, Ont.
3. Woodcrest Pietje Friesland 25559. Thirty-day record .. .	2 9 26	2001.7	57.25	71.57	Donat Raymond, Montreal, Que.
JUNIOR TWO YEAR OLD CLASS					
1. Pietje Car Born DeKol 22877 ..	2 0 8	436.0	15.41	19.24	W. W. Brown, Lyn, Ont.
2. Colony Meta Korndyke 20613 .	2 1 22	445.9	14.37	17.96	
Thirty-day record	2 1 22	1082.1	59.16	73.95	Colony Farm, Essondale, B.C.
3. Pietje Inka Josephine 22876 ..	2 0 5	408.3	13.39	16.74	W. W. Brown, Lyn, Ont.
4. Hetta Iosco Wayne 24021	1 10 11	367.	13.36	16.70	D. Caughell, St. Thomas, Ont.
5. Toitilla DeKol Beauty 21468 ..	2 1 17	328.1	12.96	16.21	J. W. Richardson, Caledonia, Ont.
6. Pontiac Sarcastic Lass 21470 .	2 0 0	325.5	12.50	15.62	J. W. Richardson, Caledonia, Ont.
7. Bell Wayne of Riverside 21465	2 1 24	314.6	12.41	15.52	Matt. Richardson, Caledonia, Ont.
8. Pontiac Jesse Hengerveld 22872	2 1 14	361.3	12.34	15.42	Brown Bros., Lyn, Ont.
9. Pontiac Inka Jewel 22873	2 0 14	313.6	11.99	14.99	

(To be continued at page 37)

AUCTION SALE

— OF —

200 SHEEP, 100 SWINE AND 75 CATTLE

(Males and Females) All Pure Bred and Registered

ORGANIZED BY THE

GENERAL STOCK BREEDERS' ASSOCIATION

OF THE PROVINCE OF QUEBEC

UNDER THE PATRONAGE AND WITH THE FINANCIAL HELP OF THE

Hon. J. E. CARON, Minister of Agriculture of the Province of Quebec

AT MONTREAL

At the East End Cattle Market

(CORNER OF FRONTENAC AND IBERVILLE STREETS)

At 10 A. M.

Thursday, 8th October, 1914

AT QUEBEC

On Exhibition Ground, At 10 A. M.

WEDNESDAY, 14 OCTOBER, 1914

The animals offered for sale will be registered in the Canadian National Records. There will be some Canadian, Ayrshire and Holstein cattle; some Leicester, Cotswold, Lincoln, Shropshire, Hampshire and Oxford sheep and some Yorkshire, Berkshire, Chester and Tamworth swine.

CONDITIONS:—Cash, except to Farmers' Club and Agricultural Societies which will be allowed time on terms that will be given by the Department of Agriculture of Quebec.

Purchasers assume all responsibility from the moment the animals have been adjudged to them. For further particulars apply to:—

J. A. COUTURE, Secretary of Stock Breeders' Association

49, GARDEN STREET, QUEBEC.

THE DAIRY

WHAT THE PUBLIC WANTS

In no branch of farming is there such scope for individuality and original lines of pursuit as in that branch known as dairying.

The man who embraces dairy farming as his profession would actually make money and increase his bank account to no small degree if he would take his cue from the princes of the drama, and, before launching out, ask himself in the words of the playwright — what is it that the public wants?

If he reads his crystal aright, he will see that "Milk, milk, milk!" is the great cry of the populace; he will hear the call for butter, and he will feel the demands for cheese.

Milk and Butter are subjects with which we may deal at some other time; but for the present let us consider the question of Cheese.

It is particularly in the manufacture and purveying of cheese that money is made by thinking.

Give a man a sufficient amount of milk of the right quality, and provided he is expert in the art of manufacture he can turn out and put on the market what is called cheese. But too many cheesemakers become proficient in the art of manufacture without at the same time paying proper and due attention to the psychology of the public taste.

Speaking broadly, we may say that there are two main classes of cheesemakers. — There are those who make cheese and, having done so, lean back in their chairs and speak with an air of aloofness and authority: "We have bent the bow we have shot the arrow, behold the product of our art! In other words — here is the cheese, this is our prescription, eat and be tankful."

Such have their day.

The other class of cheesemakers ask themselves, what do the public want? They recognize that those who can provide what is wanted have a much stronger hold than those who provide what they think should be wanted.

The first class is a highly successful mechanical contrivance; the second class is a human device for tickling the palate and supplying the needs of those who are pleased to call themselves consumers.

In the curriculum of the course which is pursued by the student in dairying, the subject which receives the least attention, and requires the most, is the study of the public taste and the market demand.

The consumer pays; and the one who pays the piper has certainly some right to call the tune.

Cheddar cheese is our staple product as far as cheesemaking goes — in this country; but the main reason, I am inclined to believe, is just because Cheddar has been made and Cheddar has been sold in the past. That is one of the best of reasons; but something is wrong when we have such a comparatively small consumption of cheese right at our very doors. It suggests, at any rate, that what the public wants is something else, or something different.

Just simply that a cheese is called Cheddar does not for a moment say that it is good Cheddar; the cheese market suffers too much from the same disease as the milk market—milk is milk and cheese is cheese. How much does the average consumer know about the different individualistic qualities of the specific varieties of cheese? Just about as much as a poet knows of underdrainage.

And how is the position going to be remedied? Not by the systematic turning out of cheese of the same stereotyped variety as has been produced for the last quarter of a century, but by a determined attempt to find what the public wants. By making an effort to put on the market something that the public will eat, and will eat with relish.

Hand in hand, therefore, with the study on the part of the maker of the cheese of the public taste, we want a cultivation on the part of the consumers themselves of a taste for cheese.

As a nutritious food, cheese is beyond compare; and yet comparatively few avail themselves of the opportunity afforded them of partaking of this nutriment. Why shall we not practise the art of palate tickling and see if we cannot find out what the public wants?

From the same type of milk the varieties of cheese which may be made are almost legion; so that it is simply a question of adaptation; and if we can, coincident with our study of the public taste, cultivate judiciously a demand for cheese of some variety or other, we shall make money, stimulate the industry, and enlarge the field of possibilities for the dairy farmer.

WILFRID SADLER.

BACTERIA AND DAIRY FARMING

The important position which the dairy farmer holds in the community at large is so well established and so readily admitted, that any arguments brought forward to emphasize the fact would be an affront to the discriminating perception of the reader, and an obvious waste of valuable space in this Journal.

If in speaking of the dairy farmer one includes all those who are connected with, and engaged in, the dairy industry, then it is permissible to say that such enjoy an almost unique position in the economics of this country; inasmuch as they are producing and distributing a perishable commodity of food — a food which is indispensable to the young child, and very largely consumed by those of maturer tears.

The broad term, dairying, may be taken as including the more specific term, dairy farming; and this being so, we will define it as that occupation or profession which is concerned with the production and distribution of milk, butter and cheese.

It follows that any influence which vitally affects, and is conducive to the success of the dairying industry, must essentially be of great moment and of more than passing interest.

In the very front rank of such influences we may safely place those much-discussed agents, *bacteria*.

How they multiply.—While very small, the fact that they reproduce at a remarkably rapid rate constitutes to a great extent their economic importance.

Their method of reproduction is that one organism just divides into two; and under good favourable conditions this takes place once every hour; and even at times as rapidly as once every half hour. Taking a conservative estimate — once every hour — we find that in twenty-four hours time one organism would become responsible for an army of some sixteen millions.

Fortunately for us, the conditions naturally prevailing are by no means always so favourable, and it is largely by management of these conditions that we are able to control the multiplication and growth of bacteria.

Like ourselves, they need food, a proper degree of temperature, the required amount of moisture, and the right proportion of air; of the last-named some organisms require much, some a little, and some no air at all.

Hence, by controlling the conditions, food, temperature, moisture and air, those engaged in the handling of milk are provided with a means of determining to a great extent not only the number, but also the types of bacteria which shall people the milk.

Varieties of bacteria.—Just as there are *tribes* and *families* in the human, so there are in the bacterial world.

And, as the requirements of some families of bacteria are widely different from the needs of others—this applies particularly to temperature— — we at once appreciate the necessity for, say, the cheesemaker having the milk at such temperature as will be favourable to the organisms he requires, and unfavourable to those without which he would prefer to be.

Dirt and bacteria.—Speaking generally, it is a sound assumption upon which to go that where there is dirt there will be found bacteria of an undesirable and troublesome nature; the matter thus resolving itself into a question of cleanliness; and to the practical man this is pretty well the sum and substance of dairy bacteriology.

We are instinctively inclined to avoid palpable and obvious dirt; yet how much more important does this become when we consider the close association with such of undesirable bacteria.

The value of bacteriology. — To pursue the study of cleanliness to its logical issue brings us to the recognition of the fact that when this is not observed, and trouble occurs, we should not be content merely to get rid of the fault. We should endeavour to trace it to its exact source, in order that in the future not only may we ourselves be able to guard against its recurrence, but others by the experience and information gained by us shall find it possible to avoid the necessity

Thirty-day record	2	0	14	1301.5	48.78	60.97	W. W. Brown, Lyn, Ont.
10. Korndyke Natoye 24346	2	3	22	318.9	11.91	14.89	J. W. Stewart, Lyn, Ont.
11. Pontiac Winona Pauline 22879..	1	11	2	265.7	11.03	13.79	W. W. Brown, Lyn, Ont.
12. Ruby DeKol Staple 22777	2	2	4	338.4	10.98	13.72	W. H. Mason, Simcoe, Ont.
13. Blanche Lyons Segis 21758 .. .	1	11	28	331.2	10.25	12.57	J. H. Chalk, Calton, Ont.
14. Forest Ridge Segis Nancy 22609	2	1	9	274.	9.99	12.49	L. H. Lipsit, Straffordville, Ont.
15. Pietje Inka Pietertje 22881 .. .							
Fifteen-day record	1	7	0	793.1	28.01	35.02	W. W. Brown, Lyn, Ont.

During the last half of June the official records of 43 cows and heifers were received and accepted for entry in the Record of Merit. No records were broken for fat production. The leader in the mature class is Inka Mercedes DeKol 6th with 26.46 lbs. butter in seven days. Madam Posch Pauline makes another thirty-day record of 117.82 lbs. butter, making her total for 120 consecutive days 12479.1 lbs. milk and 507.98 lbs. butter. Lulu Posch Rose in the Senior four-year-old class with 26.83 lbs. butter and in this class, Oakvale Elsie Johanna makes a 30-day record of 115.09 lbs. butter. In the Junior four-year-old class Zarilda Clothilde 3rd DeKol makes another 30-day record of 114 lbs. butter, making her total for 60 consecutive days 6605.9 lbs. milk and 229.0 lbs. butter. The Junior three-year-olds are led by Woodcrest Cornelia Pietje with 25.35 lbs. butter in 7 days and 49.28 lbs. in 14 days. Sara Jewel Hengerveld 2nd C. is first in the Senior two-year-old class with 15.91 lbs. butter in 7 days and 62.40 lbs. in 30 days. Of the 14 in the junior two-year-old class Pietje Car Born DeKol comes first with 19.24 lbs. butter in 7 days.

of treading the same path of expensive and disastrous experiment.

It may legitimately be claimed that in the study and practice of the essentials of bacteriology we have the chief means whereby an enlightened conception of the problems pertaining to dairying may be realized.

One may observe that if we are acquainted with the several sources from which undesirable bacteria may arise, our success in the pursuit of dairying will depend upon the effectiveness of the means we adopt in the minimizing of the risks of those marauders; and also upon the manner in which we encourage the development of those types of bacteria so necessary to the maker of butter and cheese.

Management of bacteria. — As far as the milk-selling farmer is concerned, it is desirable for all bacterial growth to be checked — not by sterilising or pasteurizing — but by careful filtering and cooling.

On the other hand, both the cheesemaker and the buttermaker require the assistance of bacteria in order to produce and perfect their respective commodities; always keeping in mind, however, that only certain types — principally the lactic-acid producing class — are so desired.

It is not too much to say that, provided one has the necessary skill, complete success in the management of milk, butter and cheese can only be attained when such knowledge is possessed as will enable the dairyman to, respectively, *cultivate or check* the various types of bacteria present in the milk, according to the particular use to which that milk is to be put.

Sources of bacterial contamination of milk. — Space does not now permit of a discussion at any length as to the specific sources to which contaminating bacteria that have obtained an entrance into the dairy may be traced; briefly, however, we may note:

The hairs and external parts of the cow herself.

The milker and the manner of milking.

The air of the cowshed.

The bacteria associated with the foods of the cow.

The dirty utensils, and

Lack of care in the general treatment of the cows and of the milk.

On the appearance of those troubles, chief among which are ropy milk, gassy curd, rancid butter and so on, the cause of the fault may almost invariably be traced to one or more of the above-mentioned sources, and the importance of the dairy farmer having what might be termed a working knowledge of bacteriology lies in the fact that such knowledge is a guide as to the particular measures to be taken in order that an outbreak may be quickly and effectively checked.

WILFRID SADLER.

WHAT MAKES MILK AND BUTTER YELLOW?

THAT the rich yellow color demanded by the public in dairy products is primarily due to the character of the cow's feed is demonstrated by recent experiments carried on by the U.S. Department of Agriculture in co-operation with the Missouri State Experiment Station. For some years dairy experts have been studying this question. Their conclusion is that, although to some extent a breed characteristic, the intensity of this yellow color may, within certain limits, be increased or diminished at will by changing the animal's rations.

Chemical tests show that the yellow pigment in milk consists of several well-known pigments found in green plants. Of these the principal one is carotin, so called because it constitutes a large part of the coloring matter of carrots. The other yellow pigments in the milk are known as xanthophylls. These are found in a number of plants, including grass, but are especially abundant in yellow autumn leaves.

These pigments pass directly from the feed into the milk. This explains the well-known fact that fresh green grass and carrots increase the yellowness of butter, the only standard by which the average person judges its richness. On the other hand, a large proportion of these pigments is deposited in the body fat and elsewhere in the cow. When the ration is changed to one containing fewer carotin and xanthophyll constituents, this hoarded store is gradually drawn upon and in consequence the yellowness of the milk does not diminish so rapidly as it otherwise would. This yellowness increases, however, the instant the necessary plant pigments are restored to the ration.

Green grass is probably richer in carotin than any other dairy feed. Cows fed on it will therefore produce the highest colored butter. Green corn, in which xanthophylls constitute the chief pigment, will also produce a highly colored product. On the other hand a ration of bleached clover hay and yellow corn is practically devoid of yellow pigments and the milk from cows fed upon il will gradually lose its color. It is, of course, indisputably true that the breed does influence the color of the milk fat; but vary the ration and there will be a corresponding variation in the color of the milk fat in each breed.

In cows of the Jersey and Guernsey breeds the body fat is frequently of such a deep yellow color that some butchers and consumers look with disfavor upon beef from these breeds. For this prejudice there is absolutely no justification. The yellowness of the fat springs from the same causes as the yellowness of the milk fat and there is no reason for objecting in one case to the very thing that is prized in the other. — U.S. Dept. of Agriculture.

A BIG DIFFERENCE

A factory patron may think and even remarks, "I guess my cows average about as high a test as Brown's, so it doesn't make any difference whether I have them tested or not."

Let us examine that a moment. If a man is content with only a fair yield per cow, where is general improvement to come in? Surely we are not going to remain satisfied with what a neighbour's medium cows manage to produce! Will that not kill all ambition?

If it is found that in another section the average yield per cow is 150 or 250 pounds of milk higher, should not the endeavour be made to raise the standard of production for each of the poorer cows?

Again, the yield of milk may average the same at two different factories, but the average yield of fat may be four or six pounds more. So if there are only 200 cows sending to the factory there would be a difference in the output of over fourteen hundred pounds of butter in one month.

So it does make a difference what a patron's cows test. Why view with complacency any "average" herd, some cows of which give only a small yield of milk testing only 2.9 or 3.1 when the herd might quickly be graded up and have each cow give 5 or 6 pounds more fat per month?

It makes a big difference to you personally as a live, up-to-date, progressing dairyman, a difference in the capacity and value of your herd, a difference in your support of the factory, and a difference in the possibility of increased output of your factory at a lower cost.

It will pay you well to test each cow.

C. F. W.

COWS THAT WEAR WELL

ONE of the many advantages reaped from systematic cow testing is the fact that it not only detects cows of indifferent value (saving dairymen the burden of providing for worthless cows, instead of their having good cows to support them) but also it has frequently discovered valuable cows. For instance, a farmer at Ennismore, Ontario, had a small, undersized 'native' cow which he intended to sell, not placing much value on her. But cow testing showed that she is one of the best in the herd both for milk and fat production. Don't sacrifice good cows.

This recalls another cow at Ayer's Cliff, Quebec, bought at auction for $28.00 because no one knew her value. Indeed she was put in with three others as the four poorest in the herd of the man who was selling out. The present owner believes in cow testing, and has refused $100.00 for her: she gave 322 pounds of fat in seven months.

The men who have built up herds that average 8,000 or 9,000 pounds of milk per cow are just those men who know, through having proved it, that cow testing pays. Your cows may be like fancy china, of very fine appearance, but they may not wear well. But the tested cows, that do produce, that do wear well, may bring you in sixty or seventy dollars each during the seven months' factory season.

C. F. W.

MEN WELL SATISFIED

SPEAKING of his experience with cow testing for three years one farmer near St. Hyacinthe, Quebec, recently expressed himself as very well satisfied. He had good reason to be, for in June this year his 9 cows averaged 1,203 pounds of milk each, a total of 10,830 pounds. Three years ago the average was only 823 pounds, the total only 7,411 pounds.

In other words, his income from the nine cows was thirty four dollars greater in one month this year.

Instances very similar to this may be found in every county where cow testing has been taken up intelligently. Near Listowel, Ontario, is a herd of 16 cows that give on the average 2,700 pounds of milk more per cow than three years ago. The addition of four hundred and thirty two dollars per year to one's income, without increasing the number of cows, is a substantial and tangible result of intelligent weighing and sampling.

Again, at Wooler, Ontario, is a herd now giving 8,307 pounds of milk per cow, an increase of almost 3,000 pounds per cow.

Record forms for milk and feed, and a herd record book, will be supplied free on application to the dairy commissioner, Ottawa.

C. F. W.

POULTRY

QUALITY IN EGGS

"THE Payment for Eggs According to Quality" is the subject of pamphlet No. 6 of the Poultry Division of the Live Stock Branch, prepared by W. A. Brown, J. H. Hare and W. H. Ault. This pamphlet points out that as a result of the 'flat rate' or 'case count' system of purchasing, Canadian farmers, during the past ten years, have lost annually large sums of money through marketing many bad and inferior eggs. Investigation into this phase of the poultry industry evinced the fact that while the wholesalers were not themselves directly responsible for the losses and shrinkage, they had at their disposal the most effective means for improvement, viz., the making of a difference, not only between the prices paid for good and bad eggs, but also between the prices paid for the various grades of good eggs. The objects of this pamphlet are to encourage the grading of eggs, which can only be done by the use of an egg tester, the payment of eggs according to quality, thus placing a premium on first class eggs, and the adoption of a uniform system of marketing, which would protect not only the producer and the consumer but also the merchant. Copies of this pamphlet may be obtained free upon application to the Publications Branch, Department of Agriculture, Ottawa.

AMERICAN ASSOCIATION OF INSTRUCTORS AND INVESTIGATORS

In Poultry Husbandry

Program of meeting to be held at Macdonald College, Quebec, Aug. 5, 6 & 7, 1914

WEDNESDAY, AUGUST 5.

Morning

Address of welcome: Dr F. C. Harrison, Prin. Macdonald College, Quebec.

Response: Prof. James E. Rice, Cornell University, Ithaca, N.Y.

1. Paper: The Inheritance of the Barred Rock Color and other Characteristics as Seen in Crossing Black Hamburgs and Barred Plymouth Rocks, also Color of Eggs as Seen in this Crossing.

Prof. W. R. Graham, Ontario Agricultural College, Guelph, Can.

2. Paper: Inheritance in Cross Breeding (Sex Limitation and the Barring Factor).

Prof. H. R. Lewis, New Jersey Agricultural Experiment Station, New Brunswick, N.J.

3. Paper: Inbreeding and its Effect on Vitality and Egg Production.

Prof. James Dryden, Oregon Agricultural College, Corvallis, Ore.

Afternoon

4. Paper: Recent Findings Concerning the Physiology of Digestion in the Domestic Fowl.

Dr. T. P. Shaw, McGill University, Montreal, Quebec, Canada.

5. Paper: The Relative Values of Certain Animal and Vegetable High Protein Feeds for Laying Hens.

Prof. J. E. Dougherty, University of California, Berkeley, Cal.

6. Paper: Feeding Relative to the Comparison of the Appetites of the Various Birds, and also the Manner in which they Change Their Rations During the Time of Going into Laying.

Prof. H. L. Kempster, University of Missouri, Columbia, Missouri.

7. Paper: Some Recent Experiments which Indicate the Various Kinds and Quantities of Food Required by the Average Hen.

Prof. T. E. Quisenberry, Missouri State Poultry Experiment Station, Mountain Grove, Mo.

8. Paper: The Feeding of Sprouted Oats, Cabbages, Mangels and Alfalfa Combined as Green Food with Relation to Egg Production and Hatching Power of Eggs Where the Individuals in the Experiment are Full Sisters.

Prof. W. R. Graham, Ontario Agricultural College, Guelph, Can.

Evening

9. Paper: Some Interesting Experiments Concerning the Incubation of Eggs.

Prof. Horace Atwood and Prof. Charles E. Weakley, jr., West Virginia University, Morgantown, W. Va.

10. Paper: General Status of the Poultry Industry in the South.

Prof. Carl H. Kennedy, Agricultural and Mechanical College, of Texas, College Station, Texas.

11. Paper: The Distribution of Egg Production.

Prof. James E. Rice, Cornell University, Ithaca, N.Y.

Discussion led by M. A. Jull, Macdonald College, Quebec, Canada.

THURSDAY, AUGUST 6.

Morning

12. Paper: Experiments with Feeding Day-Old Chicks with a Prepared Ration.

Prof. M. E. Jaffa, University of California, Berkeley, Cal.

13. Paper: The Value of Sour Milk for Feeding Little Chicks.

Roy E. Jones, Assistant, Department of Poultry Husbandry, Connecticut Agricultural College, Storrs, Conn.

14. Paper: The Controlling Factors in the Feeding of Chicks (Ash and Protein).

Willard C. Thompson, New Jersey Agricultural Experiment Station, New Brunswick, N.J.

15. Paper: The Practical Side of the Agglutination Test.

Dr. George S. Gage, Veterinary Science Department, Massachusetts Agricultural College, Amherst, Mass.

16. Paper: Preliminary Investigations Concerning Roup.

Prof. A. G. Phillips, Purdue University, La Fayette, Ind.

Afternoon

17. — A visit to the various departments of Macdonald College. A boat trip down the St. Lawrence to Montreal, including shooting the Lachine Rapids.

Evening

17. Paper: The Rhythm of Egg Production.

Dr. H. D. Goodale, Massachusetts Agricultural College, Amherst, Mass.

18. Paper: A New Method of Measuring the Rate of Fecundity in the Individual Fowl.

Dr. Raymond Pearl, Maine Agricultural Experiment Station, Orono, Maine.

19. Paper: The Fertilization of Eggs and the Effects of Previous Fertilization upon Subsequent Matings.

Prof. C. T. Patterson, Missouri State Poultry Experiment Station, Mountain Grove, Missouri.

20. Paper: The Effect of Mammalian Corpus Luteum Extract on Ovulation in the Domestic Fowl.

Dr. Raymond Pearl and Frank M. Surface, Maine Agricultural Experiment Station, Orono, Maine.

21. Paper: Artificial Fertilizer and the Determination of Vitality in the Male Bird by the Microscope.

Mr. Loyal F. Payne, Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma.

FRIDAY, AUGUST 7.

Morning

Business Session.

22. Paper: Development of Work in the Poultry Departments of our Agricultural Colleges.

Prof. James E. Rice, Cornell University, Ithaca, N.Y.

23. Paper: The Management of a College Poultry Plant.

Prof. J. C. Graham, Massachusetts Agricultural College, Amherst, Mass.

24. Paper: Housing Problems as Met with in Arid Climates Such as California.

Prof. J. E. Dougherty, University of California, Berkeley, California.

25. Paper: The Use of Curtains in Poultry Houses.

Prof. James Dryden, Oregon Agricultural College, Corvallis, Oregon.

Afternoon

26. Paper: Plan of Producing a Uniform Product and an Attempt at Stocking the Country with One Breed of Fowl.

Prof. W. R. Graham, Ontario Agricultural College, Guelph, Canada.

27. Paper: Extension Work in Rural Schools.

W. G. Krum, New York State College of Agriculture, Cornell University, Ithaca, N.Y.

Paper: Poultry Culture in the Rural Schools.

N. E. Chapman, University of Minnesota, University Farm, St. Paul, Minnesota.

28. Paper: Effective Extension Methods, Poultry Field Meetings, Poultry Trains, Educational Exhibits, Rural Short Courses, Poultry Institutes, Correspondence Courses as Conducted by the Missouri State Poultry Experiment Station.

Ralph H. Searle, Vice Director, Missouri State Poultry Experiment Station, Mountain Grove, Missouri.

Paper: Experimental Work and Boys' and Girls' Poultry Clubs.

Prof. McHerner, Manitoba Agricultural College, Winnipeg, Manitoba, Canada.

30. Paper: Poultry Organization for Educational Purposes. (Historical Sketch.)

A. L. Clark, New Jersey Agricultural Experiment Station, New Brunswick, N.J.

Discussion on Extension Work, led by M. A. Jull, Macdonald College.

Evening

31. Paper: A Poultry Survey of the City of Ithaca.

O. B. Kent, Cornell University, Ithaca, N.Y.

32. Paper: The Progress of the Egg Circle Movement in Prince Edward Island.

T. A. Benson, Dominion Poultry Representative for Prince Edward Island, Charlottstown, P.E.I.

33. Paper: Market Quality of Eggs.

E. W. Benjamin, Cornell University, Ithaca, N.Y.

34. Paper: Co-operative Extension Work.

Prof. J. O. Linton, Michigan Agricultural College, East Lansing, Michigan.

35. Paper: The Poultry Problems of the Corn Belt.

Prof. D. O. Barto, University of Illinois, Urbana, Ill.

SWAT THE ROOSTER

POULTRYMEN and farmers are annually losing a large sum of money through the marketing of many bad and inferior eggs. This has been largely the result of the flat rate or "case-count" system whereby eggs have been bought by number without regard to quality.

WOMAN'S WORLD

HOMEMAKERS' CLUB

Formed at Lennoxville, Que.

A meeting of the ladies of the vicinity of Lennoxville was held in the office of the Macdonald College demonstrator at Lennoxville on Friday evening, June thirteenth, at eight o'oclock, for the purpose of forming a Homemakers' Club. Mrs. True acted as chairman while Mrs. Atto took the minutes of the meeting.

Miss Campbell from Macdonald College was present and gave a most interesting lecture on the work and aims of clubs of this kind.

Considerable discussion followed as to the advisability of forming a club at once. It was moved by Mrs. John L. Robinson and unanimously agreed that a club be immediately inaugurated in Lennoxville.

Mrs. George Mitchell was elected president, Mrs. Walter Reid, vice-president, and Mrs Atto, secretary.

It was decided to hold the next meeting on the second Thursday in July at Lennoxville when it is hoped that a programme can be mapped out for the following meetings.

A hearty vote of thanks was moved by Miss Mabel Mitchell to Miss Campbell for her able address and her willing assistance in organizing the club, which was heartily approved.

The meeting then adjourned.

Among the ladies present were the following: Mrs. Walter S. Armitage, Mrs. George Mitchell, Mrs. MacDonald, Mrs. True, Mrs. Walter Reid, Mrs. Ed. Reid, Mrs. John L. Robinson, Mrs. Frank R. Mitchell, Mrs. Atto, and Miss Mitchell.

Some years ago when eggs were worth only a third or half as much per dozen there possibly was some excuse for this system. To-day, when eggs represent a very large item in the receipts of the country it is time for a change in our system of marketing eggs.

It has been found that eggs which have been fertilized constitute the greater portion of the inferior eggs that are unfit for human consumption. It is not necessary that these eggs remain under a broody hen for a time, a temperature of seventy degrees being, in itself, sufficient to cause the germ to commence to grow. If the heat is constant the development of the chick will continue, but if it ceases, or ceases only for a time and is again supplied later, putrefaction at once sets in and the egg becomes bad. This is ordinarily called a rotten egg. On the other hand, infertile eggs or eggs that are laid by hens that have no association with the male bird do not, under ordinary conditions, deteriorate very rapidly.

There are still too few farmers who make any effort to insure infertility. The impression prevails among many that the presence of the male bird in a flock is essential for a maximum egg yield. This assumption has been proved beyond a shade of doubt to be without foundation.

It has been estimated that Canadian farmers and poultrymen lose from one to two million dollars annually through the presence of partially incubated eggs in the produce that is marketed. All parties selling eggs for market should kill off, dispose of, or remove all male birds from the flock immediately after the breeding season. The fact that the best trade in the cities in Canada now offer a premium of from one to five cents per dozen for non-fertilized eggs suggests a financial consideration that no farmer or poultryman can afford to overlook.

S. A. BERGEY.

POULTRY NOTES

It does not matter whether a hen "sets" or "sits", if she lays.

Keep the eggs in a cool place, preferably at from 30 to 40 degrees.

Collect the eggs frequently during this warm spell.

Exposure to the sun quickly deteriorates a new-laid egg.

A hen must certainly feel uncomfortable with the hot sun prostrating her during the daytime, and lice sapping her vitality during the night. Provide her with shade and spray with a 10% solution of creolin carbolic or zenoleum solution weekly during the hot weather.

August is the month to clean. Don't forget to thoroughly clean and whitewash your chicken house.

Don't forget the constant supply of water for the hen during the hot spell. Eggs contain about 66 parts of water.

CHICKEN THIEVES

There are at least thirty-two insects that are parasitic on fowls. Some of these, like the red mites, visit their host only to take food, and spend the rest of their time on the under side of the roosts, in cracks and crevices and other places of seclusion. Others, like lice, normally stay on the birds, although occasionally some individuals crawl off, especially into the nest. Some of these parasites live on the surface of the skin and upon the feathers, deriving their nourishment either by sucking the blood, like the red mite, or by chewing the skin and feathers, like lice and some sorts of mites. Others again bore under the skin, causing a skin disease, the most common being scaly leg.

The economic importance of these external parasites is very great. Fowls infested with lice cannot prove profitable. The egg yield is considerably reduced, as they are constantly robbed of blood and their rest is disturbed. Sleep is as important to the birds as it is to man.

Keeping the plant free from lice.—It is not necessary for the poultryman to know and distinguish these thirty-two species of parasites or to know their life history. Neither is it necessary to know and remember their scientific names. It is only necessary to know that some stay on the birds, while others only go on them at night to feed, and spend most of their time on the sides of the roosts, nest boxes, etc. These can best be exterminated by applications of 10% solution of some well-known disinfectant. One application is not enough as some eggs may hatch later on, and hence it needs at least two or three applications.

Method used at Macdonald College. Spray with a 10% solution every week during the warm weather and every two weeks in colder weather. The roosting boards, nests, floors and walls should be thoroughly sprayed. Should the birds be lousy, dust twice with lice powder, with an interval of a few days. This method keeps the flock free from lice. Once a year we thoroughly white-wash the inside of the building as a special precaution.

Lice powder: — 3 parts gasoline,
1 part crude carbolic.

Mix together and add by stirring enough plaster of Paris to take up all the moisture. As a general rule it will take about 4 qts. of plaster of Paris to 1 qt. of the liquid. When enough plaster has been added the mixture should have a dry pinkish brown colour, with a fairly strong carbolic odor.

S. A. BERGEY.

FOODS AND FOOD PREPARATION

Lesson VII

GELATIN

Our subject is rather a pleasing one for a summer's day. One forgets its homely origin in thinking of the number of cool and dainty dishes which may so easily be prepared with it.

Source.

Gelatin is obtained from the connective tissue of animals. This tissue is largely made up of collagen which on boiling yields gelatin. Any form of connective tissue may be made to yield gelatin and much commercial gelatin is simply a purified glue derived from hide clippings. When buying gelatin care should be taken to get a brand that is made under sanitary conditions, as it can easily become infected with disease bacteria. Gelatin made from calves' feet is of a high quality.

Food value.

Food Value.

Gelatin belongs to a division of the proteins called "albuminoids". These are not true proteins. They lack certain substances which make up true proteins and therefore cannot of themselves build up the tissues of the body. They can, however, be used for fuel, and prevent the true proteins from being used up for this purpose. For this reason they are often called "protein sparers".

Digestibility.

Gelatin is easily digested in the stomach and readily absorbed in the intestines. It fixes a good deal of acid in the process of digestion and is useful in cases of acid dyspepsia, if not given in the form of acid jellies. As it melts at body temperature it may be classed as a liquid and is useful in cases of fever. Nourishing dishes may be made from gelatin by combining it with eggs and milk.

Kinds.

There are on the market three kinds of gelatin:

(1) powdered,
(2) sheet,
(3) granulated.

The first is sweetened and often adulterated.

The second, if of a high quality, is usually considered one of the purest forms, but it is rather inconvenient to use. The third is more convenient to use and if a good brand such as "Knox's Sparkling Gelatin" is selected, the results will be most satisfactory.

Classes of Jellies.

1. Plain, — (1) Sweet — lemon, orange.
   (2) Savory — mint, aspic.
2. Sponges — plain jellies with white of egg folded in.
3. Creams — plain jellies with whipped cream folded in.

Proportions.

The proportions depend to a certain extent upon the time of setting and the weather. The greater the time allowed the less gelatin may be used. On damp rainy days a little more should be allowed. Avoid using too much gelatin — a stiff, gluey jelly is an abomination. The point is to have a jelly which will keep the shape and yet be of a delicate consistency, sparkling and trembling. The following proportions may be generally followed:

SCHEDULE FOR GELATIN DISHES

Name.	*Liquid.*	*Gelatin.*	*Flavour.*	*Sugar.*	*Other Ingredients.*
Lemon.	1 c. water,	1 tblsp.	1-4 lemon juice,	1 c.	
Orange.	1-2 c. water, 1-2 c. orange juice,	1 tblsp.	2 tblsp. lemon juice,	1-2 c.	
Wine.	1-2 c. water, 1-2 c. sherry,	1-2 tblsp.	2 tblsp. orange juice, 1 tblsp. lemon juice,	1-2 c.	
Fruit.	1 c. fruit juice,	1-2 tblsp.	1 tblsp. lemon juice.	to taste,	as desired.
Custard	2 c. milk,	1 tblsp.	1 teasp. vanilla,	1-3 rd. cup,	3 egg yolks, 1-4 tsp. salt.
Custard. Sponge.	2 c. milk,	1 tblsp.	1 tsp. vanilla,	1-3rd. cup,	2 eggs, 1-2 tsp. salt.
Caramel Bavarian Cream.	1 c. milk,	1 tblsp.	1-2 teasp. vanilla,	1-4 c. caramel,	1-2 c. dates, 1-8 c. almond, 1-2 c. whipped cream.
Fruit Bavarian Cream	1 c. fruit juice,	3-4 tblsp.	1 tblsp. lemon juice,		1-2 c. whippe cream.
Tomato Jelly.	1 c. strained tomato,	2-3 tblsp.	Celery Salt, Parsley,	1-2 tsp.	1-2 c. thick cream, 1-2 tsp. salt.

General Rules.

1. Soak the gelatin in four times its measure of cold water.

2. Dissolve the gelatin and sugar in the boiling water used for the jelly and stir until *completely dissolved.*

3. Cool slightly and pour into *cold, wet* moulds and put in a cool place or on ice to set.

4. If fruit juice, such as lemon, orange or pineapple is used, it must be *simmered* with the water for three minutes. Fruit juices contain an enzyme or ferment which destroys the jellying power of the gelatin. The enzyme is especially strong in the pineapple. By simmering the juice the enzyme is destroyed.

5. To remove a jelly from the mould, dip the mould for a second into hot water. Invert the mould on the serving dish and the jelly will drop out.

Sponges.

Follow the general rules for plain jellies. Allow to cool to the consistency of honey. Beat with a dover beater until foamy and *fold* in the stiffly beaten egg white and pour into cold wet moulds.

Creams.

Follow the general rules for plain jellies. Allow to cool to the consistency of honey. Beat with dover beater until foamy. *Fold* in the whipped cream and pour into cold wet moulds.

To garnish a mould.

Various kinds of garnishes may be used according to the nature of the jelly. Candied cherries, angelica, strawberries, lady fingers, bits of sponge cake, bananas, nuts, etc.

With a skewer dip the cherries or otner garnish into the jelly and arrange in the bottom or sides of the mould, in the pattern desired. Pour over barely enough jelly to cover the bottom of the dish; when this is set enough to hold the garnish in place, pour over a little more; when this is set, but not too firm, pour in *slowly* the remainder of the slightly cooled jelly.

Bits of left-over cake and jam moulded in the centre of a jelly make a delicious dessert. Cooked apples, rice, dates, etc., may all be used.

Gelatin dishes may be served with whipped cream or custard sauce.

Custard Sauce.

1 cup milk.
1 egg or 2 egg yolks.
1 tblsp. sugar.
1-2 teasp. vanilla.

Beat eggs and sugar together until well mixed. Scald milk in double boiler and stir a little of the hot milk into the eggs. Stir this into remainder of milk in boiler and stir constantly until a coating forms on the spoon. Strain *at once* into a cold bowl and add vanilla.

If a thicker sauce is required use only 2-3 cup milk. Whipped cream may be folded into this when cold.

F. CAMPBELL.

THE CHILDREN'S HOMER

VI

HERA and Athena, when they saw that the Trojans were driving back the Greeks, put on human form and came down to fight, themselves, turning the tide of victory again in favour of the Greeks.

The Trojans were forced back almost to their walls, when Helenos, one of Priam's sons, begged Hector to go to the city and bid the women pray to Athena.

While Hector was gone the fighting continued, but not so fiercely.

Diomede, a famous Greek hero, met Glaukos and asked him who he was, for he would not presumptuously fight against a god.

Glaukos replied, "Why do you ask my name and race, for men are as many on the earth as leaves of the forest. And the wind blows and they are gone. What can one man matter among them all? But if you wish, I will tell you who I am. I am descended from Bellerophon, of whom all men have heard, for he slew the terrible Chimaera, the beast of three heads, who breathed fire and smoke. Bellerophon had three children, one of whom was my father."

Then Diomede told Glaukos gladly that his own grandfather had been Bellerophon's friend, and therefore he would not fight with him. The two heroes agreed to avoid each other in the battle, for the sake of the old friendship between their families, and, as a pledge, they exchanged armor, according to the custom of those times.

In the city Hector bade the women whom he found at the Scaean gates to go pray the gods for help. He met his mother, Hecuba, and urged her to go also to Athena's shrine. Then he sought for Paris, and found him in Helen's apartment, polishing his armor. Hector reproached Paris for letting others fight his battles for him while he idled in his chamber, and Paris admitted the justice of his reproof, promising to follow him out to battle at once.

As Hector turned away, Helen spoke to him softly, blaming herself for this terrible war, begging his forgiveness for the sorrow she had brought upon Troy, bitterly wishing that Paris, for whom she had left her home, were at least a braver man.

Hector answered kindly, but said, "Do not detain me, Helen. My courage must not fail, while the Trojans miss me from the battle. But do you send Paris out, that he may come and bravely do his share."

Then Hector, looking for Andromache his wife, learned that she had gone to the tower of the gates to watch the battle. Following her thither, he met her returning, and the nurse bearing in her arms their little son.

Andromache, when she saw him, cried out and ran to him, glad to know him safe. She begged him not to go again to battle, for she and the child could not spare him to be killed. All she loved had died, father, mother, sisters, brothers; Hector was everything in the world to her.

But Hector reminded her that Troy depended upon him and he must not cowardly flee from danger. He said, "Yet such a stormy day shall come (I know it in my heart), when Troy shall fall and the people of Priam perish. But the thought of that does not grieve me as does the thought of you, a slave in Greece, drawing water for the proud Grecian dames. And I shall be dead, unable to help or save you; this is the saddest part of all my fate".

Then Hector held out his arms to take his little boy, but the waving black plumes on his father's helmet frightened the child and he hid his face. So Hector, laughing, set his helmet on the ground and tossed his boy up into the air, and kissed him and prayed that he might grow up to be a mighty warrior. Then he kissed Andromache and went back to fight for Troy.

At the gates Paris, splendid in his richest armor, met him, and the brothers went on together.

When they had come once more to the field of battle, Helenos urged Hector to challenge the Greeks to send a champion to meet him in single combat, and Hector readily agreed. The Trojan heralds gave the signals for a parley; the Trojans all stopped fighting, and then the Greeks, and Hector offered to fight alone with any Greek hero.

At first the Greeks were all afraid, for they thought that the only hero they had who was equal to Hector was Achilles, who would not fight. But Menelaos, though he knew that he could not overcome Hector, was too brave not to try, and offered to meet the challenge. The other kings

OF GENERAL INTEREST

MACDONALD COLLEGE

Third Year Examination Results

THE following students have completed the Third Year work and are entitled to enter the Fourth Year. (Names in order of merit.)

Class I.—McCormick, James Hugh, Barbados, B.W.I.
Class II.—xMcOuat, John Hubert, Lachute, Qué.
Sadler, Wilfrid, Ste. Anne de Bellevue, Que.
King, James Hayes, Sussex, N.B.
x Russell, Charles, 500 W. 121st street, New-York, N.Y.
Williamson, Harold Freeman, Ste. Anne de Bellevue, Que.
Mitchell, Homer Dean, Drummondville, Que.
Grove-White, Eric, Kilbyrne, Doneraile, Co. Cork, Ireland.
Hicks, Ora Campbell, Petitcodiac, N.B.
Boyce, George Coomley, Athelstan, Que.
Class III.—x Ricker, Earl Malcolm, 45 Fairmont St., Malden, Mass.
xx McOuat, Leonard Christie, St. Andrews East, Que.
Chute, Clifford F., Waterville, N.S.
x Taylor, Andrew Gilmore, Dewittville, Que.
Westbrook, Lawrence J., Morganville, N.Y.
x Presley, Fred. Young, 356 Ferry St., Malden, Mass.
xx Roy, Harold, Bower, Sabrevois, Que.
xx McKechnie Richard Edey, Wyman, Que.
Aegrotat. — Evans, Harry Isaloy, Hampton, N.B.

---

would not allow that, and finally it was decided that ten heroes should take their chance by lot.

The lot fell on Ajax Telamon, the tallest of the Greek heroes, but not the strongest.

So Hector and Ajax fought,—and neither could win the victory. They fought till darkness came, and then the heralds separated them. They exchanged gifts, as Hector said,

"That men of Troy and Greece may say, 'Thus
their high quarrel ends,
", 'Those that, encountering, were such foes, are
now, being separate friends!', "

Hector gave Ajax a sword, whose handle was driven through with silver studs. And Ajax gave Hector a girdle.

Then the armies retired each to their own place. When the Greeks had feasted and were in council, Nestor advised them to build a strong wall around their camp, with gates to allow horses and chariots to pass in and out, and a deep ditch all around, except at the gates, so that the Trojans could not come too near, to burn their ships.

This the Greeks did. The Trojans, meanwhile, also were in council, and one old man said:

"Send back Helen and her wealth. We have no justice on our side in this quarrel, and we shall be ruined in the end."

But Paris was angry and said:

"Send back all the treasure, if you will, and all I have besides, but never Helen."

Priam decided that they would offer to the Greeks all Helen's treasure and more, and also ask for a truce while both sides might burn the dead who had fallen in the long fight that day.

To this offer the Greeks replied that the Trojans must return both Helen and the treasure, but that they would keep the truce.

And this they did, both seeking out the dead next day, and burning them with solemn rites.

"Priam commanded none should mourn, but in still silence yield their honoured bodies to the fire, and only grieve in heart."

MARGARET GRAY.

TAKES THE BACKACHE OUT OF HOUSEWORK

By C. H. SEAVER

"JOHN", said a tired woman at the end of an unusually hard day, "why can't I have an engine to help in my work around the house? You seem to have cornered all the labor-saving machinery."

John pushed his chair from the supper table. "Fine time you'd have with an engine," he remarked. "I'd have to start it, and like as not you'd be calling the boys in from the field to stop it for you after it got to going."

"Not at all," retorted the nettled wife, "and an engine of the right size to run my washing machine, churn, and pump water for me, would take about nine-tenths of the back-ache out of my house work."

Small boy starting an Eclipse Engine. Scene on Tennessee Farm.

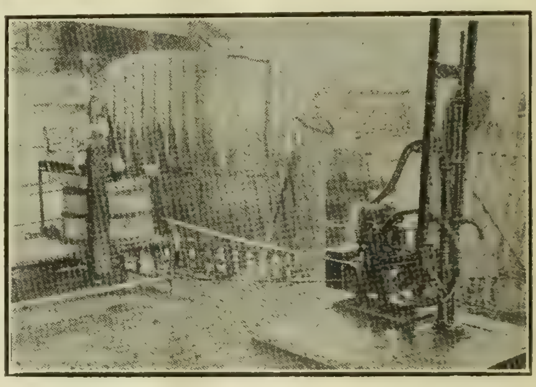
This up-to-date woman was right, and the fact that her many hard-working sisters have not yet reached her point of view accounts for the few women who know engines—even small ones. Yet these engines deserve as much consideration from the woman on the farm as from her husband. It is as important to save money and labor in the house as outside of it.

At the commonest of every-day tasks a powerful little engine soon makes itself a necessity. Imagine a wash-day which consisted of nothing more than putting clothes, soap and hot water in a washer, giving a few quick turns to the wheel of a little engine, and leaving it alone to do its work. An hour or so later the clothes are thoroughly washed, ready to be put through a wringer turned by the same engine. Churning is reduced to the same simplicity, and the hard work of pumping water for the house becomes a thing of the past.

One Eclipse Engine at the house supplies running water and does chores, another in the pasture supplies water for the stock.

While the little attention needed can be easily given the engine by any housewife, there is another solution that gives her the use of the engine, and at the same time makes another problem easier. The solution is the growing boy, and it is the problem of keeping him on the farm that is at least partially solved. His liking for machinery finds an outlet in caring for a real engine, and it is stimulated by the fact that the engine does useful work. The woman whose son is her "engineer" need have no fear that her power plant will go back on her when she needs it most. Starting and caring for an Eclipse engine is not a hard task, for even such a small boy as the one shown at the wheel in the accompanying illustration. As an educator the engine has, for the growing boy, an inestimable value. From it he learns the care of machinery, the principle of the internal-combustion engine, and the economy of labor-saving machinery for tiresome chores. It prepares him for the operation and care of larger engines.

Overtopping all other advantages of the small gasoline engine is the all important one of economy. Conservative estimates on an Eclipse engine, made by Fairbanks, Morse & Co., show that by its use upward of $50.00 can be saved in a year; taking into account only chores, and work done by the men. This amount would be considerably increased if woman's work was also made a part of its duties. A few cents worth of gasoline would suffice to do the hardest day's washing, and experience shows that in the work of pumping, two pints of gasoline will supply power to raise 2,000 gallons of water against an 80 foot head.



No. 1 Eclipse Engine supplies running water and does the washing.

Two sizes of Eclipse engines are now placed on the market, the one referred to above being the Eclipse No. 2. The No. 1 Eclipse Engine, while built on the same pattern, has approximately one-half the capacity of the larger size, lifting 1,000 gallons of water per hour also against an 80 foot head. Both sizes are of the vertical four-cycle type with jump-spark ignition, and are water cooled. The hopper is cast as an integral part of the cylinder and head, and is so made that no injury can be done to the engine even if the cooling water in the hopper should be frozen solid. In coldest weather the engine starts easily and does its work perfectly with very little attention.

Thus, for the woman as well as her husband, gasoline and the internal-combustion engine have opened up the way not only to the enjoyment of more leisure time, but to a more economical accomplishment of her work. It is not an expense, but an investment, as truly as are the machines that manufacturers have put at the disposal of her husband. Seen in this light, the returns not only in money, but in comfort, satisfaction and educational value, are great, compared with the moderate purchase price and small operating expense. The husband who realizes that his wife's work as well as his own can be put on a more profitable basis, by the use of gasoline engines, has taken an important step forward.

x Failed in one subject. xx Failed in two subjects.

HUNTING SPIRIT IN THE AIR

How it Affects the Sons of Nimrod—Guns and Dogs and Shooting Togs the Talk of the Day

SIGNS have already appeared — signs of the hunting season, which is near at hand. Signs of a good season, too.

Over the hills and mountains, at about this time of year, hovers a sort of mist, visible only to the sons of Nimrod. It is not inert, but strangely beckons. By those who have the eyes to see and the gift and grace of understanding it is called "the spirit of hunting".

If you would smile at this fancy, remember the story that is told of Whistler the artist. A tourist stood beside the famous painter in a country of lakes and mountains. One was seeing the same sunset that the other was only looking at.

"I don't see anything in a sunset," complained the tourist.

"But don't you wish you could?" said Whistler.

The spirit of hunting, perhaps, will some day be embodied in marble — the masterpiece of a Borglum.

The zest and exhilaration of the hunt are not to be known vicariously, by proxy. They are learned only through experience, but it doesn't take very long. After the first hunting trip there is no cure for the malady that results. Some friend of yours, for example, disappeared into the woods with rifle and camping kit, and when he came back he was a different man. His beard was shocking. He never acted the same again. Like Barkis, however, he was a willin' victim; and every year when the fever comes and he takes to the hard miles and crooked trails, there is no holding him back. The best thing you can do is to go along with your hunter-friend. You can easily get your doctor to advise it.

Now is the hunter's time of anticipation. It is the time when the office-caged man has hallucinations even in business hours. He looks out of the window and sees a herd of mountain sheep feeding in their sky pastures. His ear catches the far drumming of a partridge. He knows of a happy hunting-ground that he could reach by train. A railroad time table, bearing evidence of much use, is locked in a drawer of his desk, and with it lies a copy of the game laws.

The boss is similarly affected, so he doesn't notice that anything is the matter. Go home with either man and you find that some room in the house looks like a sporting-goods store, and all through dinner you know that he is thinking of a camp menu of grouse, trout and venison. Finally, after all the necessary small-talk, he discovers that you belong to the hunting fraternity. That settles it. Big-talk, then, for the rest of the evening, and nothing else. After dinner your host makes you examine his Remington, aim it and look through the shining barrel; he proudly calls your attention to the antlers on the wall (though you had seen them before) and tells you the whole story; and when it has grown late he urges you to stay overnight, apologizing for the bed he offers you by saying he wishes it were a bed of balsam boughs.

Your true hunter reckons not the hardships of the trail. He welcomes them. They increase his joy. Even disappointments have a certain fascination. He tells you with great gusto of the deer he didn't kill, and includes the incident in the story he sends to his favorite outdoor magazine. Just notice the conclusion of the fllowing paragraph, taken from an account of a bear hunt:

"While putting the dogs into the brush at the bottom of a gulch, something attracted my attention up the mountain side on the rocks. I looked up and beheld a fine little brown bear gazing down upon us. I threw my gun to my shoulder and fired, but an instant late, for just as I pulled the trigger he dropped out of sight behind the rocks. The dogs saw him, however, and the chase was on. Mr. Bear turned into the brush and down the gulch he came, with both dogs close at his heels. Close to the Rancher they crashed through the thick undergrowth — so thick that it was difficult to determine which was bear and which was dog. The Rancher got in several shots, but with no effect. Down the mountain we ran, dogs and bear in the lead, everybody yelling to encourage the dogs and in the hope of scaring the bear up a tree. Breathless and weary, we finally got to the dogs, who were lying down under a tree, 'all in' and no bear in sight. His pace had been too hot for our unhardened pups and he had escaped." (Now hear the conclusion of the matter.) "It was the Rancher's first bear and he was much disappointed not to get him. We were all agreed that it was the best sport that we had had in a long time, hence were pretty well satisfied."

It was "the Rancher's first bear," even though it escaped. There spoke the true hunter. And by the way, that party did not finish their trip empty-handed — not in a country that abounded in bears, mountain sheep, mountain goats, cougar and deer, as well as the smaller game, like pheasants and rabbits, which any townsman or farmer can find near home.

A hunter is as old as he feels, and judged by that standard he has the advantage of old Ponce de Leon, who searched long and vainly for the Fountain of Youth. Though the gift of the trails and tramps and campfires is physical health and strength, one always comes back with a sense that somehow an even richer legacy has been bestowed.

QUEBEC FAIRS, 1914

List of Exhibitions to be held in the Province of Quebec by the Agricultural Societies during the year 1914.

Society.	*Place.*	*Date.*	*Secretary.*	*Address.*
Argenteuil,	Lachute,		G. J. Walker,	Lachute.
Arthabaska,	Victoriaville,		Hon. Ls. Lavergne,	Arthabaska.
Bagot,	St. Liboire,		L. A. Brunelle,	St. Liboire.
Beauce, Div. B.	Ste. Martine,	Sept. 30,	Pierre Fortier,	Lambton.
Beauharnois,			W. Martin,	St. Ls. de Gonzague.
Berthier,	Berthierville,	Sept. 22,	G. Allard,	Berthierville.
Bonaventure,			M. LeGallais,	Paspebiac, West.
Brome,	Brome,	Sept. 1-2-3,	G. F. Hall,	Brome.
Chambly.	St. Bruno,	Sept. 9,	A. Charron,	St. Hubert.
Chateauguay,	Ste. Martine,	Sept. 8,	N. Mallette,	Ste. Martine.
Drummond,			J. C. St. Amand,	L'Avenir.
Gaspe, Div. A,			J. J. H. Balleine,	Cape Cove.
Huntingdon, A,	Huntingdon,	Sept. 10-11,	W. F. Stephen,	Huntingdon.
Huntingdon, B,			R. Ellerton,	Hemmingford.
Iberville,	St. Alexander,	Sept. 8-9,	J. E. Boivin,	St. Alexander.
Jacques Cartier,	Strathmore,	Sept. 2,	J. S. A. Ashby,	Lachine.
Joliette, A,	Joliette,		J. O. Guilbault,	Joliette.
Joliette, B,			J. O. Leveillé,	Ste. Marthe.
L'Assomption,	L'Assomption,	August 7,	I. J. A. Marsan,	L'Assomption.
Megantic, A,			J. B. Campbell,	Campbell's Corner.
Laprairie,			A. Matte,	St. Constant.
Laval,			J. Gagnon,	Ste. Rose.
Maskinonge,	Louiseville,	Sept. 10,	C. Caron,	Louiseville.
Mégantic, B,	Plessisville,	Sept. 10,	J. B. Vallee,	Plessisville.
Missisquoi,	Bedford,	Aug. 26-28 (inclusive),	C. O. Jones,	Bedford.
Montcalm,			J. E. E. Marion,	St. Jacques.
Montmagny,	Montmagny,	Sept. 17,	A. Proulx,	Montmagny.
Montmorency, A,	Chateau Richer,	Sept. 30,	J. Cloutier,	Riv. aux Chiens.
Montmorency, Div. B,			E. Letourneau,	Ste. Famille,
Napierville,			A. Collette,	St. Remi.
Pontiac, A,			P. McMahon,	Chapeau.
Quebec (county),	Quebec,		J. B. Delage,	54, Bridge St., Quebec.
Richelieu,	Ste. Victoire,	Sept. 10,	J. Desjardins,	Ste. Victoire.
Richmond,	Richmond,	Sept. 9-10,	A. E. Main,	Upper Melbourne.
Rouville,	Rougemont,	Sept. 15-16,	A. Ares,	Rougemont.
Shefford,			N. O. Rockwell,	Waterloo.
Sherbrooke,	Sherbrooke,	Sept. 5-12,	H. B. Miller,	Sherbrooke.
Soulanges,	Pont Chateau,	Sept. 15,	G. R. Vernier,	Coteau Landing.
Stanstead,	Ayer's Cliff,	Aug. 25-26-27,	J. P. Bowen,	Hatley.
St. Hyacinthe,	St. Hyacinthe,	Sept. 8,	R. Morin,	St Hyacinthe.
St. Johns,	St. Johns,		C. M. D. Langlois,	St. Johns.
St. Maurice,	St. Barnabe,	Sept. 24,	E. Bellemare,	St. Barnabe.
Three Rivers,	Three Rivers,	Sept. 29,	M. Pothier,	Three Rivers.
Two Mountains,	Ste. Scholastique	Sept. 21-24,	J. W. Sauve,	Cote Double.
Vaudreuil,	St. Lazare,	Sept. 17,	Jos. Denis,	Vaudreuil.
Vercheres,	Ste. Theodosie,	Sept. 17,	J. H. Gervais,	1489, Papineau str., Montreal
Wolfe, No. 1,	Marbleton ,		T. E. Evans,	Bishop's Crossing.
Wolfe, No. 2,	North Ham,	Sept. 15,	E. O'Bready,	Wotton.
Wright,			R. K. Edey,	Aylmer, Box 114.
Yamaska,			A. O. Comire.	St. François du Lac.

Provincial Exhibition at Quebec,	Aug. 31-Sept. 5,
Fair at Valleyfield,	Aug. 18-22,
Fair at Three Rivers,	Aug. 24-29.

(Signed) Oscar Lessard,
Secretary, Council of Agriculture, Quebec.

CANADIAN ENGINEERS INSPECT CONCRETE ROADS

Party of fourteen visit Wayne County, Michigan, and get first hand facts

RECENTLY a party of Canadian Highway Engineers and Municipal Officials interested in good roads, under the guidance of Mr. L. S. Bruner of the Canada Cement Company Limited visited Detroit and Wayne County, Mich., to learn how this progressive American community is building a comprehensive concrete road system of which it is justly proud.

The party included: J. F. Ure, Woodstock, Ont., Engineer for Oxford County; R. H. Spencer, Acting Mayor, Trenton Ont.; G. R. Marston, Simcoe, Ont., Engineer for Norfolk County; F. M. Rutherford, St. Catharines, Ont., Engineer for Lincoln County; W. J. Hollingsworth, Hamilton, Ont., Assistant City Engineer; M. Manigault, Strathroy, Ont., J. H. Jackson, Brantford, Ont., R. Clarke and W. E. Nesbitt, Merriton, Ont., L. J. Wookey, C. P. Botsford and W. Coles, Toronto; L. S. Bruner and R. S. Muller, Montreal.

Wayne County now has nearly one hundred miles of the finest concrete roads in the world, one stretch of which extends in a smooth unbroken surface for a distance of 21 miles, passing through the villages of Wayne and Dearbourne, and it is a noteworthy fact that after much experimenting with every kind of road building material the Board of County Road Commissioners has adopted concrete as its standard.

The party covered about eighty miles of highway of every description and in every condition from the worst to the best. The tour proved an exceptionally strong object lesson to everyone of the party and much gratification was expressed at the completeness of the building equipment and the excellent results obtained.

Fortunately, the party was enabled to see practically every operation of road building from the grading of the subsoil to the finished road, of which one machine can lay 750 square yards in one day. The method of reinforcing and its advantages was shown and explained. Much interest was shown in the thorough manner in which every operation was carried out, especially the curing of the finished road and the hauling of materials to where the road was being built. The cars of sand, stone and cement are sidetracked on the railway line nearest the place of operation and unloaded with a steam shovel into a string of 30 small dump cars holding one and a half cubic yards. These cars are hauled, by a "donkey" engine, in some instances a number of miles, to the spot where the materials are mixed to make the road. The narrow-gauge track over which this miniature train runs is laid in sections that can be easily handled by two men. Properly curing the finished road takes seven days. As soon as the concrete has set, it is covered with two inches of sand and then wet down with a hose daily; this permits the whole mass of concrete to harden uniformly and eliminates surface cracks that would otherwise appear under the heat of the sun.

As a whole the methods used by Wayne County Road Commissioners are very simple and undoubtedly the most economical for the construction of an extensive and permanent road system; at any rate they are the result of years of study and experiment by able engineers.

However, it is noteworthy that the conditions with which Wayne County has to deal would not be in evidence in most Canadian counties; broken stone, which is usually about one-half of the mixture used, is obtainable within a few miles in every county throughout the Dominion with few exceptions whereas Wayne County hauls its broken stone a long distance. Then again, the special machinery and equipment used across the border is not absolutely necessary, for men and teams could be used in place of most of it.

Wayne County began building concrete roads in 1909 and the first stretch laid in that year was carefully inspected by the party at close range and the concensus of opinion was that it is now as good as when put down, and the maintenance cost has been practically nothing during the five years that it has been used. A striking contrast is shown when the condition of this concrete stretch is compared with other stretches of the same road, built at the same time of other materials and at approximately the same cost, but which now resemble the "Rocky Road to Dublin" and must be rebuilt in the near future.

One of the engineers expressed the opinion that if Wayne County could afford to have such excellent roads, there is no excuse for Canadian communities to delay the building of systems that will be as good as the Wayne County roads, for there are few Canadian counties that are not infinitely richer in natural resources if not in actual capital, and we can greatly benefit by the experiences of the county across the line.

The individual and collective opinion voiced was unanimous for concrete as the logical and economical material for permanent good roads in Canada and one that will enable every community to invest its road money so that it will return a dividend instead of being spent to fill up the mud holes.

DESTROYING QUACK GRASS

It is Necessary to Attack It Vigorously

A subscriber writes: "We have about four or five acres of quack grass on our farm. Can you tell us of some practical way of getting rid of it? We are anxious to get it under control so as to prevent its spreading over the farm."

If your land is in pasture or meadow, allow the quack grass to grow until nearly ripe. Then cut it for hay and plow the land about three inches deep. Follow the plow with a sharp disc to cut the sod up. Disc and cross disc and harrow until the patch is quite mellow. Then go over it with a spring-tooth harrow or some other implement that will bring the quack roots to the surface. Rake the roots together with a horse rake, haul them off the ground, dry and burn them. Continue cultivating the field with a spring-tooth or a spike-tooth harrow once every week till late in the fall. Haul off as many of the roots as possible and destroy them. Late in the fall plow the field again and about a half inch deeper than the first time.

Early next spring again use the disc, spring-tooth harrow or other implement — anything to get more roots on top where they can be raked together and hauled away. Continue this cultivation at weekly intervals till the latter part of May. Then give the ground a good coat of well rotted barnyard manure and disc it in as well as possible and seed the land to millet, sorghum, or buckwheat—any good smothering crop that can be utilized to advantage for forage or grain and yet be gotten off the ground early in the fall. As soon as the crop is removed plow again if necessary. Then start the disc and keep it going once a week till frost.

Early the second spring cultivate again and then plant to corn. If another coat of manure can be given, apply it. If you have a silo, put the corn into it so as to get it off the ground early in the season. If silage cannot be used, cut the corn as soon as it is well glazed and shock it. Then get busy with the disc and seed down to winter wheat. In the spring, sow clover and timothy. Leave the land in grass for two years, using it one year as meadow and the other as pasture. Plow the pasture in the fall and plant to corn. Cultivate the corn thoroughly during the growing season and Mr. Quack will be gone. This is a rather long process, but good crops will be raised while it is in progress and the quack grass will surely vanish in the meantime, provided the seasons are reasonably favorable — that is, not too wet. It is difficult to do much toward destroying quack grass in wet seasons.

To exterminate quack grass is no small job. On the other hand, the man who goes at it with a determination to win will succeed, and the extra cultivation he gives the land will pay for itself in larger crops. There is nothing like persistent cultivation to increase the available supply of plant food in the soil, and there is nothing like it for destroying weeds.

The reason for allowing the quack grass to form nearly mature seed, is to weaken the underground rootstocks as much as possible before trying to exterminate them. A general would rather attack a half-starved enemy than a well-fed one. While quack grass is producing seed, it is drawing heavily upon the food stored in its rootstocks and hence they are in a weakened condition at that time. The period between the ripening of the seed and the end of the growing season is used by the quack plant for storing food in its underground rootstocks from which it multiplies the following spring. The stored-up food is always used for early spring growth. The less of this food the rootstocks have stored up within them, the more easily they are destroyed.

If you desire to exterminate the quack grass in the field referred to go about it with a determination to win. Half-hearted measures never destroyed this persistent weed, which reproduces not only by seed, but also by its rootstocks. Quack grass is a perennial of the worst kind and vigorous measures must be employed to kill it. The weed has spread over thousands of acres in southern Minnesota and northern Iowa during the past five or six years. The wet seasons have favored its spread, especially since many farmers have paid little attention to it. — Exchange.

CARE OF THE MACHINERY

By Maurice Kane, Manager of Experiments, International Harvester Company

THIS question is of considerable importance to the farmers of the present day, owing to the large amount of machinery used on the farm. In considering this question we will start with new machines. The important thing to look out for is that the nuts are kept tight so that all the parts will be kept in proper operative relation to each other.

Next in importance is the use of good oil for lubricating the moving parts. This matter requires some discretion so as to not waste oil or time. It is quite common for the ordinary operator to squirt oil into all oil holes, especially the ones that are most convenient, regardless of whether those parts need frequent oiling or not. As only about half of the parts on binders or mowers need frequent oiling and then only in such quantity as will be retained by the bearing, the overflow does no good. When a bearing is neglected and the parts get hot, and cutting takes place between the shaft and its bearing, and it is not convenient to take the parts out to smooth them off, a little graphite mixed with the oil will be quite beneficial.

When you are through using your machines for the season they should be properly housed. Before putting them away the polished parts should be greased to prevent rust. This would include the knotter and sickle on the binder and the knives on the mower. This would also apply to all other implements used on the farm such as cultivators, disk harrows, ploughs, etc. When the binder is put away, the canvases should be removed and hung up in the tool shed or barn. A very common practice in connection with the canvases is to fold them up. This is not a good plan, as experience has shown, on account of mice making their headquarters there during the winter and in many cases damaging the canvas.

After machines have been used for some time they should be gone over carefully and the worn parts adjusted and put in order. This work should be done before starting on next season's work; when the grain is ripe and grass fit to cut, you will not have time to do a good job of repairing. On your mower it is very important that looseness at both ends of the pitman be taken care of and that the guards be in proper alignment. Those are the most important points in connection with mowing machines. By alignment of guards, we do not mean the points of the guards; we refer to that portion through which the knife sections work. To line up the guards, take a piece of fine string, connect to the inner and outer shoes, letting it bear on the ledger plates about midway between the front and rear. Draw this spring tight and you can easily see if the guards are in line with the shoe plates. As the guards are made of malleable iron they will stand bending up or down to bring them in proper alignment with the shoe plates.

The less attention you pay to matters of this kind the better it is for the manufacturer, as you will need more machines and repairs.

SILAGE THE BEST SUCCULENT FODDER FOR WINTER

SILAGE is recognized as a good and cheap feed for all farm live stock. Within the last 30 years silage has come into general use throughout Canada and the United States and especially where the dairy industry is flourishing. There are so many good reasons why a farmer should have a silo that a late Farmers' Bulletin published by the U.S. Department of Agriculture at Washington gives the following reasons:

1. Silage is the best and cheapest form in which succulent feed can be provided for winter use.
2. An acre of corn can be placed in the silo at a cost not exceeding that of husking, shocking, grinding and shredding.
3. Crops can be put into the silo during weather that would not permit of making and curing hay or corn fodder.
4. A given amount of corn in the form of ensilage will produce more milk than the same amount would if shocked and dried.
5. There is less waste in feeding silage than in feeding fodder. Good silage properly fed is all consumed.
6. Silage is very palatable and has a beneficial effect on the digestive organs.
7. More stock can be kept on a given number of acres of land when silage is the basis of the ration.
8. On account of the smaller cost for labor, silage can be used for supplementing pastures more economically than can soiling crops, unless only a small amount of feed is required.
9. Converting the corn crop into silage clears the land and leaves it ready for another crop sooner than it would if the corn was shocked and husked. Because of these many advantages it is the general opinion among dairy farmers who have built silos, that the use of silage has increased the milk production per cow and has increased the profits per acre, though it is no doubt true that in certain localities, which are well adapted to the growth of alfalfa or other hays of good quality, the same amount of food nutrients may be produced at less cost in the form of hay than as silage. We would like to add that where a very large number of cows are kept, the extra labor required to handle so much hay is a very large item of expense. As suggested by the reason given in number eight it is very much easier to feed cows ensilage than hay to the same number during the winter season when they are in the barn.

SURFACE CULTIVATION

It Requires Forty-five Tons of Water to Grow One Bushel of Wheat

AGRICULTURAL college men tell us, that it takes 45 tons of water to grow a bushel of wheat. Thirty bushels will use twelve inches in depth over an acre of land. For very obvious reasons a twelve-inch rainfall would not be enough moisture to mature a thirty bushel crop if there were not some moisture already in the ground. During the hot and windy days of summer the water evaporated might amount to three inches of rainfall or more in a week, if no means were used to prevent it. At this rate the whole year's precipitation might be lost in a month or two. At the very best, some of the soil moisture is bound to be lost through evaporation. A rainfall of, say, twenty inches during the year does not guarantee that the crop will have that amount upon which to grow. Plow, harrow, and pack as we may, the air will pick up a good deal of the moisture that falls. When this work is done poorly a much larger percentage of the precipitation escapes. The question, then, of conservation of soil moisture is of prime importance.

Practical conservation of the precipitation that reaches the soil in one form or another consists of preventing its escape through evaporation by obstructing this process at the soil surface. Surface tillage that forms a dust mulch is the most practicable means of doing this. This movement of soil moisture to the surface, from which point it is evaporated into the air, is accomplished by means of a physical law called capillarity. The disturbing of the soil at the surface breaks up the capillary connection and stops evaporation to a large extent. Hence the value of surface cultivation. Numerous tests have shown that frequent cultivation of the soil in summer will prevent the evaporation of from seven to ten inches of water where the rainfall is not over 13 inches. Thus moisture that otherwise might escape into the air is kept in the soil where it can be used by the seed in hastening germination and in supplying water to the growing plant.

HOW TO OBTAIN CONTENTS OF A SILO

WE are frequently asked for information concerning the amount of silage in a silo at certain depths, how to divide the amount of silage in a silo into two equal parts, etc.

The following table compiled from Wisconsin Bulletin No. 59 will be useful to our readers when such questions arise.

Table showing the computed weight of well-matured corn silage at different distances below the surface, and the total weight to those distances, two days after filling.

Depth of silage--feet	Weight per cubic foot of silage at different depths—lbs.	Total weight one square foot area to depth given —lbs.
1	18.7	18.7
2	20.4	39.1
3	22.1	61.2
4	23.7	84.9
5	25.4	110.3
6	27.0	137.3
7	28.5	165.8
8	30.1	195.9
9	31.6	227.5
10	33.1	260.6
11	34.5	295.1
12	35.9	331.0
13	37.3	368.3
14	38.7	407.0
15	40.0	447.0
16	41.3	488.3
17	42.6	530.9
18	43.8	574.3
19	45.0	619.7
20	46.2	665.9
21	47.4	713.3
22	48.5	761.8
23	49.6	811.4
24	50.6	862.0
25	51.7	913.7
26	52.7	966.4
27	53.6	1020.0
28	54.6	1074.6
29	55.5	1130.1
30	56.4	1186.5
31	57.2	1243.7
32	58.0	1301.7
33	58.8	1360.5
34	59.6	1420.1
35	60.3	1480.4
36	61.0	1541.4

HOW TO USE THE TABLE

Assume a problem. A silo containing 21 ft. of silage after settling has been fed down until only 8 ft. remain. Silo 16 ft. in diameter. How much remains?

The weight of one square foot to a depth of 21 ft. is seen from the table to be 713.3 lbs. If 8 ft. remain 13 ft. have been fed. The weight of 13 ft. is found in the table to be 363.3 lbs. Substracting this from 713.3 leaves 345 lbs. which equals the weight of the 8 remaining feet. Multiplying this weight by the number of square feet in the area will give the number of pounds left in the silo. The area of a 16 ft. silo is 201 sq. ft.; 345 times 201 equals 69345 lbs. or 34.6 tons. Dividing the number of pounds by 2,000 gives the number of tons. To obtain the area of a silo multiply the square of the radius in feet (one-half the diameter) by the factor 3.1416. For example, a silo 18 ft. in diameter has a radius of 9 ft.; 9 squared is 81. Multiply this by 3.1416 and the answer is the number of sq. fit. in the area.—Hoards' Dairyman.

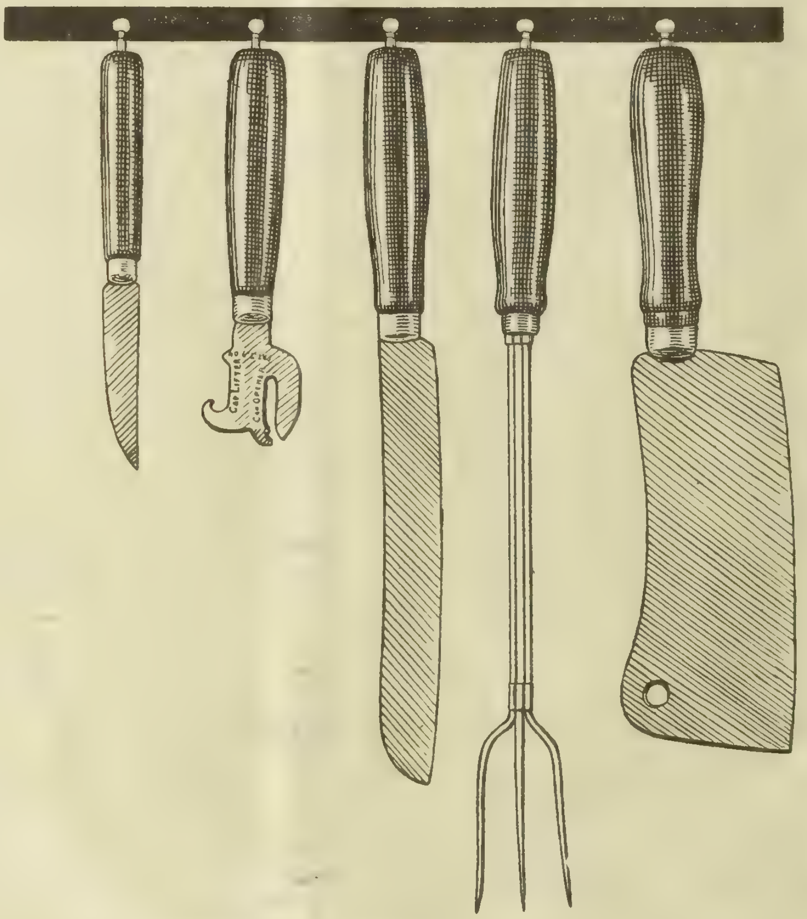
ESTIMATING THE VALUE OF A COW

IN estimating the value of a cow, the amount of milk she produces and the per cent. of fat it contains, and the amount of feed she consumes must be considered. It is not enough to know how much milk a cow is giving, but the percentage must also be known. A cow that produces 20 pounds of 5 per cent. milk daily, produces as much fat as a cow giving 33 pounds of 3 per cent. milk. Plenty of cows will produce 3 per cent. A good cow will produce from 250 to 350 pounds of fat in a year. Through careful selection, feeding, and good care, we now and then have herds that will average 400 pounds of fat per cow per year. Herds of this character, however, are not plentiful. In view of this, a cow that will produce more than 250 pounds of fat in a year is considered a good cow. But no breeder should be satisfied with this kind of cow. He should aim to have his herd average at least 400 pounds of fat per cow per year. The time may come when this amount will be excelled, but after the 400-pound mark is reached, the process of developing the whole herd to do better than this is slow and painstaking work. There are, of course, cows that will produce better than 1,000 lbs. of fat in a year. These are exceptional animals, but they show the possibilities in the breeding of dairy cattle.

Another supply of

KITCHEN SETS

Has just been received!



They are given FREE with one year subscription to

The Journal "Le CANADA" Weekly

Send your order at once, while they last.

LIBRARY OF THE UNIVERSITY OF ILLINOIS

The JOURNAL of AGRICULTURE

AND HORTICULTURE

Volume 18 September 1st 1914 Number 3

East Sherbrooke and the Grounds where Canada's Great Eastern Exhibition will be held. —— September, 5th to 12th.

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

King Arthur's Court is filled with glee
Joy reigns therein this morn;
The Queen—God Bless Her Majesty—
A Pudding has made from BENSON'S CORN.

Food Fit for a King!

—but so cheap that everyone can afford it. That is why BENSON'S PREPARED CORN is so popular. It's a food for all seasons; excellent for warm weather because it is not over-heating.

BENSON'S PREPARED CORN

The housewife who keeps a package of BENSON'S PREPARED CORN in her pantry is never at a loss for a dainty dessert—one that can be quickly prepared in half a hundred different ways.

Delicious with any flavoring, fresh fruit, or extract. Can be served in so many different ways that it is always new and refreshing.

Send a postcard for a dainty little recipe book that tells how to make the many table delicacies that owe their goodness to BENSON'S PREPARED CORN.

:: **THE CANADA STARCH COMPANY LIMITED** ::

Makers of the Famous Edwardsburg Brands

MONTREAL :: CARDINAL :: BRANTFORD
FORT WILLIAM.

BENSON'S PREPARED CORN

**Better Butter—
Bigger Profits!**

If you wish your butter to be smooth and uniform, use the

"BRITISH" Butter Worker

Adopted by the best dairies in Gt. Britain and Canada. Makes the butter firm—even—consistent all through. Results in **better butter** and **bigger profits!**

Sold by dealers everywhere. Three sizes — 14 in., 17 in. and 20 in. wide.

MAXWELL LIMITED, St. Mary's, Ont. 4

KODAK

Follow your business closely

by keeping not merely a record of weights, but also a Kodak picture record of your stock at various ages, and the development under different food conditions, — file in an album for reference. Such a record will enable you to follow your business more closely, because it is a record you can keep, and the pictures will tell the facts.

**KODAKS, $7.00 and up.
BROWNIES, $1.00 to $12.00.**

Ask for free catalogue of your dealers, or we will mail it.

CANADIAN KODAK CO., Ltd.,
604 King St., W. TORONTO.

Last distribution of the Automatic Stitcher of "Le Canada". Dont delay for there is only few dozen to spare.

What is Your Best Horse Worth to You?

Yet your best horse is just as liable to develop a Spavin, Ringbone, Splint, Curb or lameness as your poorest!

KENDALL'S SPAVIN CURE

has saved many thousands of dollars in horse flesh by entirely curing these ailments.

Garnet, Ont., Feb. 25th, 1913.
"I have used Kendall's Spavin Cure to kill several jacks, and removed a bunch of long standing, caused by a kick." SID. GRAHAM.

Don't take chances with your horses. Keep a bottle of Kendall's handy, $1—6 for $5. Our book "Treatise on the Horse" free at druggists or

Dr. B. J. KENDALL CO., Enosburg Falls, Vt. 82

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE
AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 101,585
FRENCH, 91,825
ENGLISH, 9,760

Volume 18
SEPTEMBER 1st 1914
Number 3

EDITORIAL

KEEPING MACADAMIZED ROADS IN REPAIR

Sir:—

THE rules adopted by your corporation for the construction of the macadamized roads contain a clause providing for their maintenance.

In order to facilitate carrying this into effect, I give below certain directions in regard to the manner in which macadamized roads should be kept up.

The ditches and bridges should be kept in good repair, in order to insure at all times the rapid running off of rain water, and especially the water from melting snow in the spring.

The bridges should be kept clear of mud. The ditches should not be overrun with grass. The roadsides should be mowed, and they should not be higher than the border of macadam, in order that the water that falls upon the latter may run directly into the ditches. The slope toward the ditches should be adequate. Places that fall in in the slopes of the ditches should be repaired, and these slopes should be kept in good order.

Wet places where underground drainage becomes necessary should be drained by transverse drains of sandstone, or by concrete or terra-cotta tile. That is, the body of the road.

For the macadam itself, care should be taken to prevent any organic matter being thrown upon it, such as sods, stalks of plants, etc. These substances injure the macadam. During dry spells, especially when it is windy, it is a good thing to water the road.

It is necessary to cover over places that get weak with pea stone, that will not blow away. A light layer will be sufficient. This protects the surface from the action of carriage wheels.

When a rut begins to hollow out it is necessary to work it up at once with a pickaxe, taking off the mud and laying bare the under layer of macadam, then refilling the opening thus cleaned with 2 1-2 inch stone, like that used in the construction of the upper layer of macadam; some sand should be put in to fill the spaces between the stones and well pounded in with a hand tamper; sprinkle at the same time to macadamize it.

The municipality should always have at its disposal, in all the macadamized roads, heaps of broken stone and pea stone.

The depressions or hollows should be treated in the same way as the ruts.

Macadam should be swept in the spring immediately after the snow disappears. When it is covered with mud it is necessary to go over it with a light scraper after rain.

At the time of the melting of the snow, care should be taken to prevent water running in the roads, especially on hills. Keeping the winter roads rolled will obviate this difficulty.

Macadam that is carefully kept up will last indefinitely, especially if the ruts and hollows are repaired before they have time to spread. A competent roadman should be employed by the year to keep up the macadam.

As soon as any defect is seen it should be repaired immediately. This is less expensive than to wait until the macadam has deteriorated.

Kindly acknowledge receipt of this letter and oblige,

Yours very truly,

J. A. TESSIER,

Minister of Public Roads.

Quebec, August 15th, 1914.

SOCIAL SERVICE CONGRESS

A most valuable and interesting Report of the proceedings of the Social Service Congress, held in Ottawa, Mach 3-5, 1914, has just been published in book form by the Council. It contains the addresses and papers presented at the Congress by the leaders of the various departments of Social Service. Conferences were held to discuss the important social problems of the day, such as the *Weekly Rest Day, The Church and Industrial Life, The Labor Problem, Child Welfare, The Problem of the City, The Problem of the Country, Commercialized Vice and the White Slave Traffic, Political Purity, Temperance, Immigration and Humanizing of Religion, Social Service as a Life Work,* and the addresses given are worthy of careful study by every Canadian who has the welfare of his country at heart.

In the *Problem of the Country Conference,* the Rev. John MacDougall dealt with the *Rural Problem,* Professor Reynolds with the *Department of Agriculture,* Rev. S. F. Sharp with the *Church and the Rural Problem,* Rev. H. Dobson with the *School and the Rural Problem,* and A. Desjardins with *Cooperation among Farmers.*

We hope the Report as published will be widely spread. It is to be regretted that it cannot be distributed free like government publications. No doubt, however, newspapers will use the valuable material in the addresses and acquaint their readers with the main points brought forward by the speakers.

The report in book form costs one dollar, and may be procured from the Secretary of the Social Service Council, Toronto.

We hope to publish portions of some of the addresses in forth-coming numbers.

WAR AND AGRICULTURE

WAR, with all its horrid slaughter of the sturdiest men of Europe, the ruining of countless thousands of homes and the laying waste of large areas of rich productive lands, not to speak of the vast losses from stoppage of commerce, the withdrawal of millions of men from productive occupations and the piling up of billions of debt, is being waged with hellish intensity in the most populous parts of Europe. Our own country is also drawn into the terrible inferno, although the blasting effects will not be so great here as in the war-stricken countries of Europe. Just what the outcome will be no person can say at date of writing (Aug. 20) , but we have the satisfaction of knowing that Britain entered upon the conflict only after every legitimate effort had been made to avert it. Militarism of Germany wanted war for reasons known fully only to itself. The causes might have been readily adjusted but militant autocracy longed to "cry havoc and let slip the dogs of war", and many will say now as on a former occasion was said, — "Just what they kill each other for we cannot well make out".

As to the effect of the war on Agriculture there can be no doubt that in the long run it will work great injury from which it will take years to recover. It is quite probable that the prices of certain farm products will greatly advance. There will be a great demand for wheat, hay, oats, horses, and meats, but beyond these the farmer will not be greatly affected. On the other hand, labor will be scarcer than ever, money will be harder to get, and merchandise in general will be much dearer. While, therefore, the farmer may think he is a gainer by the war, he will find out sooner or later that the extra cost of what he has to buy offsets to a great extent the better prices for what he has to sell.

Moreover, it is just possible that the countries which usually supplied Europe may, during the war, send their produce to the United States to avoid danger of capture, with the result that our market there may be affected adversely. If, on the other hand, Britain retains possession of the seas there will be a demand for all the farm products of a certain kind that we can spare.

After the war, and we all pray that it may be short, there will likely be a reaction, for Europe will be so impoverished that she will not be able to buy nearly as freely as before the war.

The war will affect Agriculture vitally in another way. Canada has been spending large sums of money on public works largely to aid in the transportation of farm products. Some of these works have been completed but others are just begun or not started. These unfinished works will be postponed indefinitely, according to the duration and cost of the war.

FEDERAL LEGISLATION AFFECTING AGRICULTURE

DURING the regular session of the Dominion Parliament, this year, three important measures bearing upon agriculture were adopted.

The Cold Storage Warehouse Act provides for

CONTENTS

EDITORIAL. — Keeping macadamized roads in repair; Social service congress; War and agriculture; Federal legislation affecting agriculture; Encouraging the sheep industry; Quebec dairymen must wake up; The report of the Committee on Technical Education.

ORCHARD AND GARDEN. — Fruit-growers' convention; Indoor tomatoes; The army worm in Pontiac; Marketing the honey crop; Phosphate fertilizer; Fruit reports.

FARM AND FARM CROPS. — Agriculture in Compton county; Co-operation; Agricultural conditions in Huntingdon country; Signs of the times in Compton county; Harvest notes from Richmond county; One man's experience not enough; Water in cellar; Surface water in well; Hydraulic ram; Home-grown clover seed; The 1914 wheat crop.

LIVE STOCK.—Distribution of rams and boars by the federal department of Agriculture; Two noted stock farms at Ormstown; Heredity as an influence in milk production; Auction sale; A Clydesdale importation.

DAIRY.—Quebec cheese in England; Summaries of dairy record centres; Ropy milk; Construction of small concrete ice-houses; Economical milk production; Men well satisfied.

POULTRY.—Improving poultry exhibits; Co-operative egg circles; Interesting convention of poultrymen; The candling of eggs.

WOMAN'S WORLD.—The homemaker's clubs in Pontiac; Foods and food preparation; The children's Homer; A scale of points in a farm-home contest; New book.

GENERAL INTEREST. — War; Hymn before action; Quebec fairs, 1914; Trade with the Orient; Canadian national parks; The country flour mills, old and new; Agricultural co-operation.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

government supervision and inspection of cold storage warehouses in which butter, eggs, fish, poultry and meat are stored for periods of over three weeks and authorizes the government to make regulations limiting the duration of storage of the various classes of foods.

The Dairy Industry Act is to a large extent a revision of Part 8 of the Inspection and Sales Act, which was a consolidation of various Acts passed between 1886 and 1896. It prohibits the sale of milk diluted with water, skimmed or partially skimmed, or milk to which cream, foreign fat, coloring matters or preservatives have been added; also that of milk from which the strippings have been retained and of milk from diseased cows.

It also prohibits the manufacture, importation and sale of butter substitutes, of "process" or "renovated" butter, and of butter containing over sixteen per cent. of water. Butter sold in prints, blocks, squares or pats is required to be of the full net weight of one-quarter pound, one-half pound, one pound or two pounds at the time it is moulded or cut, and butter sold in tins or other packages alleged to contain any definite weight of butter is required to be of the net weight claimed. The incorporation of inferior curd or cheese or of any foreign substance in cheese is forbidden.

The Adulteration Act is amended by the rewording of the section relating to honey, and the insertion of a similar section referring to maple syrup and sugar. The clauses relating to maple syrup and sugar are as follows:

"No person shall manufacture for sale, keep for sale, or offer or expose for sale as maple sugar, any sugar which is not pure maple sugar, nor as maple syrup any syrup which is not pure maple syrup, and any maple sugar or maple syrup which is not up to the standard prescribed by the sixth schehule to this act shall be deemed to be adulterated within the meaning of this act.

"The word 'Maple' shall not be used either alone or in combination with any other word or words on the label or other mark on a package containing any article of food or any article of food itself which is or which resembles maple sugar or maple syrup, and any article of food labelled or marked in violation of this subsection shall be deemed to be adulterated within the meaning of this Act."

The standards referred to as prescribed in the sixth Schedule to the Act fixes the maximum amount of water in maple sugar at 10 per cent. and that in maple syrup at 35 per cent. and also sets limits for the "ash" and "lead" values obtained by chemical analyses of the goods. The use of clarifying agents is not prohibited.

The section relative to honey provides :

"The word 'Honey" shall not be used either alone or in combination with any other word or words on the label or other mark on any package containing any article of food which is or which resembles honey and which is not pure honey made by bees, and any article of food labelled or marked in violation of this section shall be deemed to be adulterated within the meaning of this Act.

"The provisions of this section shall not apply to any syrup or compound manufactured and sold for medical purposes only."

ENCOURAGING THE SHEEP INDUSTRY

THE July number of the Agricultural Gazette might reasonably be called a "Sheep number". What the various agricultural agencies, governmental and educational, are doing for the sheep industry is set forth in a number of contributions by the officials in direct charge of the work. Mr. E. S. Archibald, the Dominion Animal Husbandman, outlines the policy of the Dominion Experimental Farms, and Mr. T. Reg. Arkell that of the Live Stock Branch of the Federal Department of Agriculture of the Provincial Governments, and professors of the agricultural colleges relate what local effort is accomplishing towards the instruction, organization and protection of the sheep breeder.

The Dominion Experimental Farms are attacking the sheep proposition from the three standpoints of breeding, feeding and shelter. They are endeavoring to compare breeds with relation to their suitability to the various districts of the country and the effect of mating high-class pure-bred rams with the average ewes of each district. They are comparing feeding stuffs of various classes in respect to their relative values for sheep feeding. The question of shelter is also being studied with reference to the various climates of the Dominion. The Central Experimental Farm is at present stocked with Leicesters and Shropshires. The Cap Rouge farm has Leicesters only. The two new farms in this province are not yet stocked, but it is intended to place Leicesters and Shropshires at Ste. Anne de la Pocatiere, and Oxfords and Rhomneys at Lennoxville. Macdonald College has Southdowns, Shropshires, Oxfords, Leicesters and Cheviots on the College farm, and has established a few demonstration flocks of Cheviots at suitable locations through the province.

The Live Stock Branch of the Federal Department loans pure-bred sires to associations of farmers living in districts where it is difficult to obtain first-class animals or where they cannot afford to buy such sires. The purpose of the Department is to discourage the use of sires of low breeding, to foster uniformity of type in each locality, and to facilitate co-operation in marketing. Such co-operation is only possible where a considerable number of neighbours keep sheep of the same class. The Live Stock Branch is also devoting special attention to the preparation of wool for market, a matter in which the Canadian sheep grower's past deficiencies have cost him dearly. To organized societies of ten or more members the Branch has this year provided the services of expert wool classifiers who have graded the products of the members assembled at a central depot.

The benefits of co-operation in the marketing of wool were strikingly illustrated in Pontiac county this year. Under the direction of Mr. A. A. Macmillan of Macdonald Colege, assisted by Mr. J. K. King, the local Macdonald College demonstrator, an association was organized to co-operate in the marketing of wool. Messrs. Macmillan and King supervised the shearing and preparation of some 12,000 lbs. of wool, which, properly graded, sold at 16 to 23 cts. a pound, unwashed-most of it at 22½ cts., cash. This price was an advance of from 5 to 7 cts. upon the prices obtained by the same farmers the previous year, when, moreover, many of them were obliged to accept payment in trade. The comment of the official graders was to the effect that the wool marketed on this occasion was one of the best samples ever marketed in Canada.

Another useful line of co-operation among sheep breeders has been entered upon by the Prince Edward Island Sheep Breeders' Association. This consists in a scheme of insurance against losses due to the attacks of dogs. The sheep owner, who desires to take advantage of this insurance, pays one cent a head annually and may pay two cents additional per head if his sheep are pure-bred. In consideration of this small premium the sheep are insured to the amount of seventy-five per cent of their value, a maximum of six dollars per head being set for grade sheep, and one of fifteen dollars for pure-breds. Half of this insurance compensation is paid by the Provincial Government as a supplementary grant to the Sheep Breeders' Association.

In Ontario insurance against losses due to dogs is provided by each municipality, out of a fund raised by a tax on dogs. The limit of compensation in that province is two-thirds of the amount of damage.

In Nova Scotia a bill somewhat similar to the

THE GARDEN AND ORCHARD

FRUIT-GROWERS' CONVENTION

THE Quebec Pomological and Fruit-growers Society will hold its summer meeting at Abbotsford, county of Rouville, on September 9th and 10th.

Discussions will take place upon the work accomplished by thr Dominion lecturers who will have just terminated their series of lectures upon horticulture. They will deal with marketing, packing, the selection of fruits and all subjects of interest to fruit-growers.

It is hoped that all those who are interested in fruit-growing will be present at this meeting. They should meet there not only farmers but also professional men, merchants and newspaper men, whose influence and advertising have helped to spread among the farmers the knowledge necessary to profitable fruit-growing.

Ontario law was defeated in the legislature in 1907, by the opposition of the fishermen and of some farmers. This bill proposed to give each municipal council the privilege of voting the law out of operation for one year at a time. In New Brunswick and in this province the law authorizes the municipalities to impose dog taxes but does not *require* them to do so. In Quebec, however, the municipal council is required to pass such a law upon receipt of a petition signed by one-fourth of the ratepayers. This throws the burden of securing protection upon the sheep breeders themselves, and affords but little encouragement to the development of the industry in localities where it is not already firmly established. The further fact that the amount of compensation is limited to five dollars per head—a smaller amount than is provided in Prince Edward Island for grade sheep—renders the law of but little interest to the breeder of pure-bred sheep. Could not our Sheep Breeders' Association work out a scheme of co-operative insurance similar to that in operation in Prince Edward Island ?

QUEBEC DAIRYMEN MUST WAKE UP

ON looking over the records received monthly at Ottawa of the yields of cows in various provinces, one cannot help but notice that wide variations exist.

In May two good records were made by one lot of 445 cows at Frankford, Ontario, giving 1017 pounds of milk and 34.4 pounds of fat, while 437 cows at Listowel averaged 1005 pounds of milk and 32.9 pounds of fat. The average of 5,260 cows in Ontario was 881 pounds of milk and 29.6 pounds of fat. (See Summaries of Record Centres, May, 1914 under Dairy Section of this paper) .

In contrast to this it is found that the 2,660 cows recorded in Quebec averaged only 661 pounds of milk and 23.4 pounds of fat; that is, 200 pounds of milk and 6 pounds of fat less. Almost every month a somewhat similar condition of affairs is found, while on the average of the whole year's production the Quebec cows are about forty pounds of fat lower in yield than their Ontario sisters; in the aggregate the Quebec cows, therefore, should yield about *nine millions dollars* worth of milk more than they do to come up to the Ontario average.

There may be several causes for this. Such questions as care and attention, suitable and abundant feed, breeding from a good sire, etc., etc., all tell. In this connection it may be of interest to note that since the dairy record centres have been established by the dairy division, Ottawa, there has been an increased demand for good dairy bulls, particularly in some sections.

Both Way's Mills and St. Hyacinthe are three pounds of fat per cow above the average yield for the Province for May, and in both these sections there are good dairy bulls.

It has been demonstrated over and over again that the influence of a good pure-bred dairy sire, one carefully selected from a productive family, is worth at least ten dollars per cow per year in increased yields of milk and fat; thus even in a small herd of 10 cows there is an extra one hundred dollars in sight annually.

Possibly some dairymen hesitate about paying a so-called high price for a good animal. But there is no reason why the principle of cooperation should not be made use of in purchasing the best type agreed upon. Farmers may club together in an association and buy three or more pure-bred dairy sires of the same breed and not related. These sires may be placed in different sections of the community, each sire in the charge of a competent dairyman selected by the members of the association. Each section should contain from fifty to eighty cows. In two years, or when the heifers are old enough to breed, the sires are exchanged from one section to another, and in another two years exchanged again.

Thus if there are three sires in an association, they may be used six years through this system of exchanging without any danger from in-breeding; if there are five sires, ten years. This plan for a cooperative breeding association is one of excellent promise. Good bulls will be saved from needless sacrifice when too young and before their real value has been determined; for there are many instances on record where certain sires would have been worth thousands of dollars to a community, but unfortunately they had been killed.

The increased cheques from the factory will soon prove the value of the suggestion, while at the same time the district will get a good reputation for high-class dairy cattle of the breed selected.

THE REPORT OF THE COMMITTEE ON TECHNICAL EDUCATION

IN 1910 the Dominion Government appointed a commission to enquire into industrial training and technical education. The Commission spent several years investigating the situation in Europe and America, and last year published a report consisting of 2353 pages.

The report contains the results of experiments carried on in other countries for many years, at immense cost, and suggests numerous applications of these results to existing Canadian conditions. A large portion of the report deals directly with rural matters, and cannot fail to be of value and interest to all who desire better country conditions.

As but few of our readers have either the time or the opportunity to wade through thousands of pages in search of this information, we have concluded to give from time to time brief articles containing what we consider to be the most important features of the report.

A DOMINION DEVELOPMENT POLICY

To begin with the most important practical finding, the Commission recommends a somewhat elaborate system of machinery by which the Dominion would carry on scientific industrial research and provide expert counsel to the provinces, and which would at the same time "preserve provincial control, encourage local initiative and develop local responsibility".

Each province would contain *local* Urban and Rural Development Boards, and a *Provincial* Development Council and Commission.

LOCAL RURAL DEVELOPMENT BOARDS

Duties:—

1. To consider by what means industrial training and technical education may be applied most advantageously to the development and improvement of workers, of agriculture, rural industries, housekeeping, and occupations in rural communities, within the county or other area served by them severally.
2. To make proposals, applications, or recommendations to the Provincial Development Council or any other authority constituted by the Provincial Government as competent to deal with such proposals.
3. To provide and maintain industrial training and technical education by means of institutions, classes, courses or otherwise, subject to the regulations of the government of the province.
4. To administer any grants received for any of the aforesaid objects.

Constitution:—

As provided for by the Province by Order in Council or by legislation.

Suggestions:—

It would appear to be desirable, where local conditions permit, that a county area should be the area served by the Local Rural Development Board. In some cases it might be found expedient to combine one county with another, or with part of one or more other counties.

Each Board to be appointed, preferably two-thirds by the educational authorities or the municipal councils of the areas served, with one-third appointed by the Provincial Authority for Industrial Training and Technical Education.

Each Board to represent:—

(1) Agriculture;
(2) Industries;
(3) Housekeeping;
(4) Education.

Having regard to the desirability of continuity of policy, appointments to be made for a term of years, a proportion of the members retiring every year and being eligible for reappointment.

It would likely be found expedient for each Board to constitute committees for the more effective carrying on of its work. The main divisions would obviously be:—agriculture, rural industries, and housekeeping, with such further divisions or subdivisions as might be thought desirable.

Special stress is laid upon the utilization of local talent. The secretary of the Scottish Education Department is reported as saying that he would rather have a thousand men and women in Scotland thinking and planning and striving to make the courses of study and the education meet the needs of their own communities than have ten thousand implicitly doing what the Department directed.

The reader will note that in many parts of Canada there are at present bodies corresponding to certain forms of the proposed Local Rural Development Boards, e. g., Farmers' and Women's Institutes, and Teachers' and Trustees' Associations. The plan recommended might tend to unify all such forces and place them in organic relation to one another and to the Province and Dominion as a whole.

S. B. S.

INDOOR TOMATOES

HOT-HOUSE tomatoes take four months to first ripe fruit and five to full crop in fair weather, but will take longer if weather is dull and unfavorable.

We renew our soil each year from a compost heap made up each October as follows:—Plow sod about three inches deep, then haul to a well-drained spot near the house. Then place two layers of sod, grass sides together, then a layer of four inches of manure. Alternate these two up to the required height of pile. This gives the fertility in the manure a good chance to penetrate into the soil. Many, however, renew their old soil with manure. This, if well rotted, may be immediately dug in but, if fresh, is placed on top and kept watered for three or four weeks, in this way washing the fertility down into the soil. Then the rough manure is raked off and the bed dug over. Between the crops we dig in a fair quantity of well rotted manure. Some growers use wood ashes or muriate of potash and bone meal on alternate crops. The soil should be limed at least once a year to keep it sweet.

For the Christmas crop we sow our seed the first week in July, and these plants should be ready to go into the bed the third or fourth week in August. The seed for our second set of plants for the spring crop in March and April is sown the first week in October and should be ready for the bed the end of January. Many florists at the present time are using Tomatoes to fill the greenhouses in summer. These should be started the first week in March and will be ready to transplant into the house the middle of April, giving a crop in June and July.

Seed is sown in flats in soil, one sand and one compost. When seedlings are showing first true leaves we transplant into two-inch pots in a soil made up of one sand to three of compost. The plants should be carefully watered and shaded, when necessary, if the sun is shining. Plants should be set fairly deeply. When the plant has filled the two-inch pot with roots and your bed is not ready you should transfer to four or five-inch pots, so as to give no check. This is especially necessary with the second crop since weather conditions may hold back the crop. Never wet plants too much as it causes them to turn yellow and grow spindly. A little dryness will produce a larger root system and sturdier plant.

In setting plants for the Christmas crop, we set them two feet apart each way, diagonally. For the spring and summer crops, eighteen inches each way. Set the plants at least one inch lower than they were in the pots.

We prune the plants to one stem, breaking off all side shoots as soon as they appear. One wire is run the length of the house above each row of plants on a level with the gutter. To this one upright wire is run from each plant, fastening to the top wire with a clip and placing in soil next plant. The plants are tied to the wire with raffia or soft cord, being careful not to tie too tightly. When first the fruit begins to color you should cut off all leaves below first stem. Then when sufficient fruit has set to ripen in the time you wish nip off the top of the plant.

Tomato plants like a dry atmosphere. Dampness breeds disease and hinders pollination. Temperature at night is best at 60, with 10-15 higher during the day. Keep the ventilators open whenever possible when weather is suitable, around noon being the best time.

Two methods of watering are in use in Ontario tomato greenhouses, sub-irrigation and surface watering. Sub-irrigation is simply laying rows of tile just below the surface of the bed two feet apart with a filling pipe coming above the soil at one end. Surface watering is accomplished either with the watering-can or hose. Sub-irrigation gives a larger yield, a stronger plant, prevents much tip rot and keeps soil open and porous like a sponge. Its only disadvantage is the cost of installing. Surface watering causes the soil to pack, prevents much of the water from getting to the bottom of the bed, excludes air, and has a tendency to cause fungus disease from dampness.

Mulching with strawy manure will give very similar results to sub-irrigation. Apply as soon as plants are set permanently. Its only defect is the change of disease.

Pollination should be carefully attended to, as insufficient pollination causes mis-shapen fruit. When flower is immature the stamens are longest. But as the flower opens to be pollenized, the pistil gradually elongates until it is much longer. Being longer and the stigma larger then the style, it tends to ward off pollen. Pollen grains adhere and germinate easily. The more pollen, the more perfectly shaped fruit. This is effected by tapping flowers, jarring uprights, or using brush. Using a spoon and stick and tapping carefully each flower is the best method. It should be done at least every other day. The pollen is most abundant on bright days. Plants and atmosphere must be dry.

Diseases.—Leaf blight or scab *(Cladosporum fulvum)* appears as rusty brown spots on the under surface of the leaf. It is caused by too damp atmosphere. Give better ventilation and allow less water on the leaves. As soon as noticed, use Bordeaux mixture, spraying thoroughly both sides of the leaf. If disease is well established it is best to remove crop, then sterilize or renew soil.

Blossom End or Black Rot is caused by insufficient moisture at roots as plants matures. Plant has become dry, and when watered the sudden filling of the cells of the fruit causes the skin to burst and allows the entrance of bacteria.

Mildew appears as purple or brown spots on the leaf. The leaf wilts where attacked. The best remedy is to vaporize sulphur in the house.

Sterilization of soil.—There are two methods, Steaming and Formalin. If you have sub-irrigation you can simply connect your steam pipes by hose to the upright and force steam through the soil until it rises in a cloud. Another method is to make a pan which is forced down over the soil and steam connection made on top. The stem is then turned on at a pressure of twenty pounds for twenty minutes. To use formalin, the following is the strength:—8 lbs. formalin to 1 gallon water; 1½ quarts of mixture to 50 gallons of water. Then use one gallon to every square foot of surface and leave for 10 days. Then dig over and plant.

Varieties.—Comet, Industry, Quex Clipper are best for winter use and to these add Bonny Best and Earliana for spring crop.

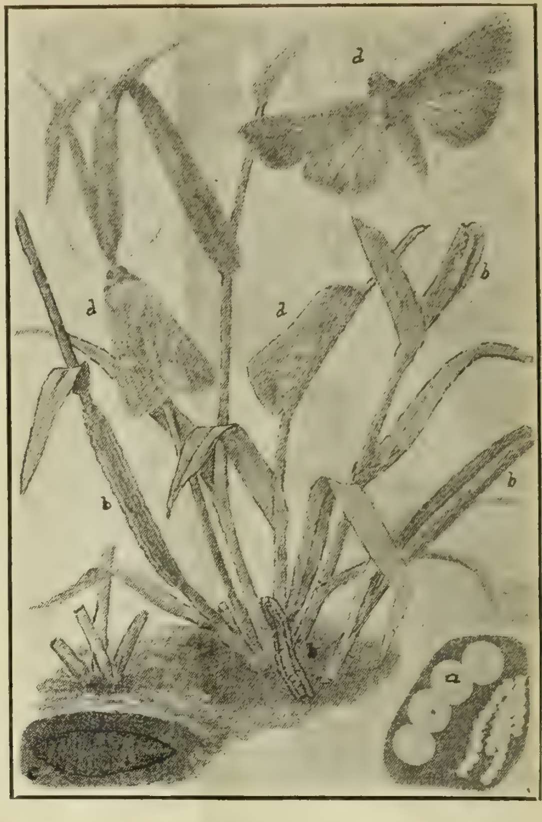
A. H. McLENNAN

THE ARMY WORM IN PONTIAC

EARLY in July the dreaded Army Worm made its appearance in several counties in Ontario where considerable damage was done to standing crops. A week later Mr. King, Demonstrator for Pontiac County, reported that the Army Worm was destroying the oat crop on several farms near Shawville, and that he had advised measures for its control. We have not heard of its presence in any other part of Quebec.

As it is altogether unlikely that any further damage will be done this year it may interest our readers to know what the Army Worm is, its habits, and the best methods of control, lest another outbreak occur next year in other parts of the Province.

The parents of Army Worms are "miller" moths, flying mostly at night. They resemble the "millers" that are attracted to lights in houses in July and August and are the parents of some of our worst cutworms. Army Worm moths may be found almost any year, but only when conditions favor their increase do they become dangerous. These conditions apparently are a dry season followed by another and the absence or scarcity of their natural enemies! Unlike the tent-caterpillars, they are hard to find, for normally they feed mainly on the rank grass of low meadows. It is only when too large numbers are bred on a small area that they abandon their usual mode of feeding and take on instead the marching habit and that of feeding in day-light.



The Army Worm-showing eggs (a), caterpillars (b), pupa (c) and moths (d).

Life-history

In Ontario and Quebec there are two broods of Army Worms in a season. Further south there are three. They usually pass the winter, like most cutworms, as half-grown caterpillars. In spring these mature, change to pupae in the ground, and the moths appear in June. The May brood of caterpillars seldom do much harm or attract attention. On the other hand, it is the brood of caterpillars which are hatched from eggs laid by the June moths that is the dangerous one. These caterpillars or Army Worms become full-grown in about 25 days, change to pupae in early August, and moths again appear about the middle of the month. These moths lay eggs from which a fall brood of caterpillars hatch, but these feed for only a short time and go into the ground to winter.

The moth is dingy, yellowish-brown, with a white spot in the centre of each fore-wing. With wings expanded it measures 1½ inches across. The full-grown caterpillar or Army Worm is 1½ inches long, dark-colored and striped with black and yellow lines.

Control

As a rule, Army Worms are not observed until they begin to ravage the standing crops and are migrating. In such circumstances they can be stopped by plowing a furrow in front of them with the steep side away from them. After they have gathered in the furrow they may be killed by a spray of kerosene or by capture in post-holes in the furrow, dug at intervals of 10 or 12 feet, where they may be crushed.

Poison baits or sprays are effective in advance of the army of worms in motion. Poultry are fond of the worms and will gorge themselves, but care must be taken for their safety when poison is used.

Enemies

The Army Worm is usually kept in check by a number of natural enemies of which a species of fly (Tachina) is perhaps the most active. Certain

THE FARM AND FARM CROPS

AGRICULTURE IN COMPTON COUNTY

Farming prosperous.—Many large Farms and fine Herds.—A beautiful Country of Hills and Valleys

COMPTON county is the most easterly section of the district known as "the Eastern Townships". It is a large county, containing about 1440 sq. miles, and in 1911 had a population of 29,630. No part of Quebec surpasses it in beauty of landscape; its hills and valleys are the pride of its people and a source of attraction to the tourist. No doubt these have been strong factors in holding the people to the land in spite of the great temptations westward and cityward. The Census Reports make this point quite clear. In 1901 the population of Compton was 26,460, in 1911 it was 29,630. Where other counties showed a decrease here was an increase of 3,170 or about 12%.

A Census Comparison

	1901			1911		
	Total Popul	English speaking	French speaking	Total Popul	English speaking	French speaking
Compton Co.	26460	11562	14460	29630	10477	18714
Eaton T'p	1796	1361	399	1765	1088	635
Cookshire	804	462	338	996	579	396
Sawyerville	428	345	71	432	344	77
Bury T'p	1560	1368	115	1668	1373	225
Lingwick T'p	791	721	69	839	671	168
Scottstown	791	408	380	933	489	431
Compton T'p	1983	1144	791	2038	872	1134
Clifton T'p	1481	628	832	515	265	250
Newport T'p	1092	932	143	997	831	143
Hereford T'p	1864	418	1433	1779	226	1523
Waterville	576	355	123	1054	756	191

Physical Features and Soils

The best farming land of Compton county occupies a broad basin about 25 or more miles wide between two parallel ridges of rather high hills which run in a north-easterly direction from the international boundary line. The eastern ridge is called the Lake Megantic anticline by geologists and the western ridge the Sherbrooke or Stoke anticline. These ridges, along with the Sutton range farther west, are in reality northward extensions of the Appalachian system of the White and Green Mountains to the south.

---

wasp-like flies, digger-wasps, ground beetles, birds, toads, etc. also destroy large numbers. It is likely, moreover, that bacterial diseases are responsible for the destruction of large numbers.

W. L.

MARKETING THE HONEY CROP

AFTER having produced a nice crop of honey comes the problem of disposing of it in the best market, and at the best price. It will be found, generally speaking, that the city market offers better returns for nicely finished and neatly packed lots of comb-honey, and that the smaller towns and rural districts will offer a better market for the extracted honey producer. The reason for this seems to be that the country market does not seem disposed to pay the price that the city market will, taking into consideration the extra labor and skill required to produce comb-honey. If you have not already an established market for comb-honey in the city, there are various ways by which one may get in touch with the large retail grocers or wholesale produce dealers. As a rule the better price will be obtained by dealing direct with the retailer. After obtaining the addresses of several prospective customers and having ascertained that they are in the market to buy honey, send them a sample case of a dozen or more sections, according to the way in which your honey is put up, and which will represent a fair average of the crop you have to sell. If you are posted as to the condition of the honey crop for the season, it is advisable to fix a price on your offerings, taking into consideration the result of the season as to whether it has yielded a good or fair crop and quality of honey. Otherwise it might be good policy to send samples to several different dealers and invite quotations. Honey is quoted among the market reports of country produce in most of the daily papers but these quotations, as a rule, are furnished by commission houses or brokers and are more liable to be a little under rather than over the correct market price dealing with commission houses or brokers better results will be obtained by selling outright at an agreed price rather than by shipping the goods to be sold for a percentage of the proceeds. It is advisable in selling comb-honey to ship to your nearest large center, i. e., to the point which will entail the shortest haul and the least rail or road handling. All packages containing comb-honey should be marked, "Fragile","Handle with care",and the like, Comb-honey should be shipped by express to insure more careful handling and a prompt delivery. Extracted honey put up in tin and carefully boxed can be shipped quite safely by freight. Extracted honey in glass will go safely by freight if well packed in straw or the like.

As previously stated, the country offers a better market for extracted-honey than for comb. The extracted-honey man usually has no trouble in disposing of all he can produce among his neighbors. A small sign posted prominently about his premises with the motto, "Honey for Sale", will bring him customers quite rapidly. Another good way to dispose of a crop is to put it up in five and ten pound pails and load up a light wagon and canvas the surrounding territory with it. If you do not wish to go to the expense of canning as above described put a big can on your wagon with a couple of hundred pounds of honey in it and retail it in bulk. In putting honey up in five and ten pound cans the most satisfactory way is to make it gross weight, and in this way cover the cost of the cans. Cans containing honey should be labeled with the producer's name as they make a good drawing card to attract future trade.

HARRY W. JONES,

Bedford, Que

PHOSPHATE FERTILIZER

Sir:—

WE are contemplating the purchase of a carload of rock phosphate. Stable manure is becoming scarcer each year and we want to know whether the phosphate rock guaranteed 12-13% phosphoric acid is about as good a fertilizer as we can procure for the money as an addition to stable manure. A.P., P.Q.

Ans. When used with stable manure ground phosphate rock will greatly increase the efficiency of the manure. The Ohio Experiment Station found that as little as 40 lbs. well mixed in the manure very greatly increased its efficiency. They found that the dissolved rock, acid phosphate, had a more decided effect, but that the raw rock cost less. For the increased crop in vegetable culture I would use 100 lbs. to a ton of manure, and if the soil is of a sandy nature would add 20-30 lbs. potash. A heavy clay loam seldom needs potash.

A. H. McLENNAN.

FRUIT REPORTS

QUEBEC.—All varieties of apples more abundant than last year. Wealthy and Alexander full crop. Fameuse and McIntosh 60-70%. Dry spell broken by rain on the 14th.

OKANAGAN VALLEY, B. C.—Dry weather ripening late peach crop three weeks earlier than last year—same applies to pears, plums and prunes. Plums very heavy. Bartlett pears 100% increase over 1913. Apples 30% increase, and of high quality. Ideal weather.

ANNAPOLIS VALLEY, N. S. Apple crop 80-90% clean, which is same percentage as spotted fruit in 1913. Crop increased 30% and fruit of larger size. Heavy drop in Baldwins and Ben Davis. Weather very favourable. Market very gloomy as buyers will not offer. Strenuous co-operative efforts being made to relieve the situation by widening markets.

NORTH-WEST STATES.—Increase over 1913 is 20%. Quality extra fine—60% "extra fancy".—Markets uncertain (see report enclosed) .

NEW BRUNSWICK.—Apple crop promises to be double that of 1913. Free from scab. Local markets good. Weather fine and dry.

ONTARIO-GEORGIAN BAY.—Apple crop 60 to 70% full and exceptionally clean. Winter varieties in Barrie and Orillia (Lake Simcoe) district, less than 25% and fall varieties 50%.

LAKE ONTARIO (NORTH) —Dry weather broken Aug. 14th. Apples clean in sprayed orchards. Early varieties ready to move. Buyers not operating. Ontario county fair to light. Northumberland heavier but undersized.

NORFOLK.—Baldwins 80%, Greenings 50 per cent, Spies 40 per cent. Total apple crop 50 to 60 per cent of full crop. Dry weather not affecting size. Fruit generally clean.

ESSEX.—Recent rains ensure heavy crop of all fruits. Apple crop same as last year, fewer Baldwins but more Kings and Greenings. Peaches full crop, St. Johns ripening next week. Plums good. Pears heavy.

NEW YORK STATE.—Apple crop now promises to double that of last year and to be 12 to 15 per cent greater than the large crop of 1912, with good quality. A big Baldwin year. Greenings better quality and size than 1913 but smaller quantity. Kings and Ben Davis excellent.

LONDON, ENGLAND.—Weather conditions favourable for fruit. Apple crop larger than previous estimates. Owing to war and high price of sugar, fruit growers now receiving very poor prices.

D. JOHNSON,
Ottawa, Aug. 15th 1914. Fruit Commissioner

The Eaton River Valley near Cookshire

The soils of Compton are somewhat variable in texture. In the bottom lands of the valleys there is much fertile alluvial soil of rather fine texture. The uplands have a covering of loam varying from gravel to fine clay, and nearly everywhere there is much stone in the soil which necessitates removal before the land can be brought under regular cultivation. On the whole the soils are strong and produce heavy crops. Good crops of hay may be grown almost to the very tops of the hills. Moreover, water is always abundant and of the best quality; springs are found everywhere, but often requiring the land to be drained.

Farmers and Farming

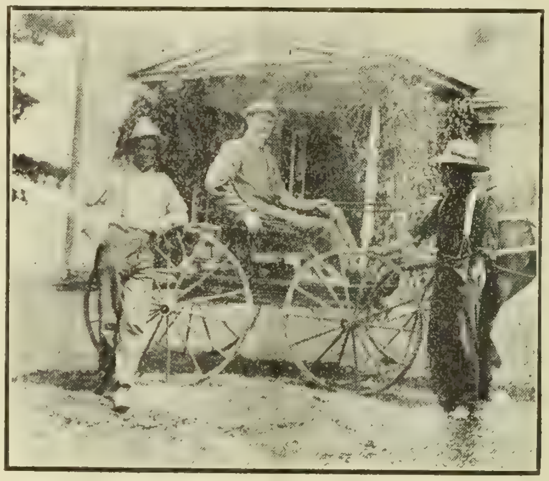
Compton County was settled about 1800 by United Empire Loyalists and emigrants from Great Britain. A large body of Scotch took possession of the northern townships of Lingwick, Winslow and Hampden, and to this day the songs of the heather-land are still dear to the hearts of the people of this district. On the other hand, the inhabitants of the western townships of Compton are largely of English origin.

Of the early settlers many families are still prominent in the county and the Eastern Townships. Such names as Pope, Cromwell, French, Hodge, Cote, Hemming and Saunders are well known and will be chronicled in the annals of Compton.

From the farming standpoint the part including Eaton, Compton, Clifton, Newport, and Bury is the choicest in the county as land eastward from this becomes more hilly and broken.

As a rule the farms are large, too large we believe for good farming. There is too much land, once cleared and broken, set aside for pasture or scrubby woodland. Most farmers will confess quite freely that they have more land than they can farm properly. One bad result has followed this practice; the owners, having had to work too hard to do the amount of work required, sometimes became disgusted with the endless moil and toil and gave up entirely. Many good families have been lost to the county on account of trying to work too many acres.

There can be little doubt, however, that the farmers of the Cookshire district are prosperous. Although the representative of the "Journal of Agriculture" was unable to visit all portions of even the region about Cookshire, he was pretty well convinced from the farms he did visit that from an agricultural point of view the district was prosperous. "The houses are comfortable and homelike; the barns are large and convenient; the flocks and herds are large and well kept; and the crops promise an abundant harvest. The whole appearance of things suggests prosperity".

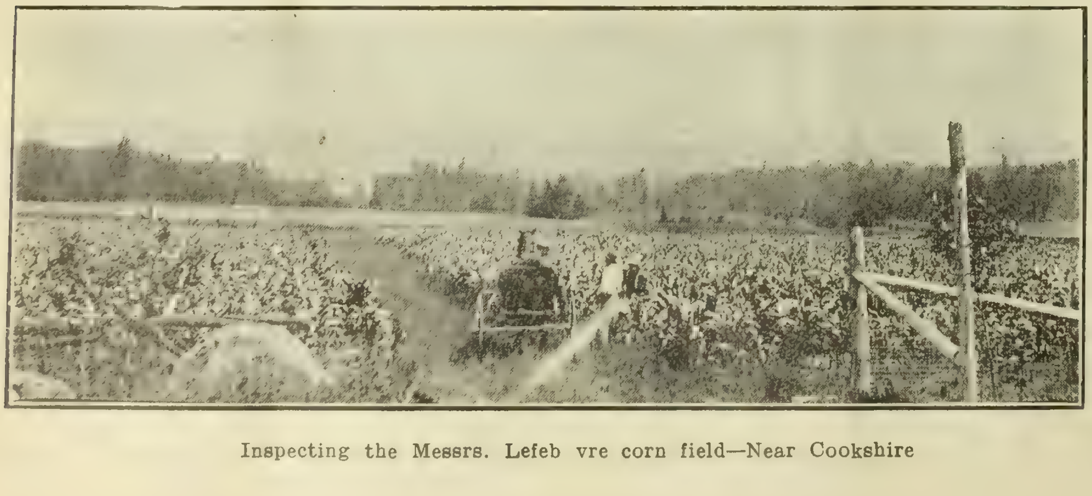


Chas. & Wm. Lefebvre standing beside A. E. Raymond, Cookshire

Farmers' Club and Demonstrators

Not content, however, with present conditions, the farmers of Compton are eager to improve their methods. They have had for some years live Farmers' Clubs of which the late Rev. Rural-Dean Robertson was the moving spirit. Lately an agricultural demonstrator has been placed at their service, and Mr. A. E. Raymond, B.S.A., has given valuable assistance, with Cookshire as his headquarters. Since June he has had the help of Mr. V. B. Durling.

During the past year Mr. Raymond has busied himself with several important matters. Instruction was given in elementary agriculture to pupils in the Sawyerville and other schools during the winter months, aid is being given toward the formation of school-fairs, fertilizer tests are being conducted on many farms with different crops and with different constituents in the fertilizer, help is freely given in connection with the egg-circles and underdrainage, and efforts are made to further co-operative buying and selling. That his efforts have met with the approval of the farmers is attested by the warm expressions in regard to the valuable work done frequently heard during the trip. Mr. Raymond's modesty has endeared him to the farmers. He disarms suspicion by his quiet, unassuming manner. He never poses as an expert over the heads of the old and tried farmers more than double his age. By getting some of his friends to try some experiments which often really mean the trial of new methods or new seed he gradually establishes a bond of confidence between the farmers and himself. (See Mr. Raymond's article in another page.)



Inspecting the Messrs. Lefebvre corn field—Near Cookshire

Farms Visited

Through the kindness of Messrs. Raymond and Durling the representative of the *Journal* was enabled to visit several of the farms in the Cookshire district. On the lower road to Sawyerville they called at the Lefebvre farm, operated by the brothers Charles and William, who took hold of a run-down farm a few years ago and are bringing it back to its old-time fertility by the introduction of modern methods. The farm consists of 400 acres of which a large acreage is under pasture. The Lefebvres are carrying out experiments (variety tests) with corn and oats. Like some other farmers they find Swedish clover is giving this year a fine stand, much superior to other varieties. An interesting result is seen here as to the value of treating seed oats with formalin solution against smut. Where treatment was given smut is practically absent, while it is quite prevalent where no formalin was used.

Mr. Donald McIntosh and son Archibald have two fine farms a mile or so beyond the Lefebvre farm. Emphasis is given to feeding for beef, although considerable cream is sent to the Sawyerville cream station. Mr. McIntosh has been trying out some fertilizers for himself and is a strong believer in the virtues of basic slag for improving conditions on his own farm. He showed us some fine crops of oats, corn and turnips.

Mr. B. Lebourveau has a fine farm and is one of the most progressive farmers of the district. He is President of the Farmers' Club. His reputation as a producer of large Plymouth Rock eggs is well known, and as an experimenter Mr. Lebourveau is carrying out some potash experiments with oats.

Along the upper road from Sawyerville to Cookshire we spent a pleasant hour with Mr. E. Chaddock, who takes time to busy himself with several things. For many years he has kept bees and has always done well with them. Lately, however, he has become interested in poultry and sheep and is working in co-operation with the extension department of Macdonald College.

Mr. George Hodge, two miles east of Cookshire, has a large well-managed farm of four or five hundred acres. He devotes most of his attention to beef-raising; his large fields of pasture are able to maintain during the summer months a great many head of steers. We were much impressed with Mr. Hodge's round barn; although built many years ago it is still quite modern in all its appointments. For convenience in feeding there can be no doubt that it stands away ahead of the square or rectangular barn, for the silo stands at the centre and the hay can be put directly in front of the stock by chutes from the mows above. As the stock face inward to the feed centre so the litter carrier runs in a circle near the circumference. As a result the cleaning of the stables is relatively easy. The barn being situated on the side of a hill is entered by short gangways to different levels.

Mr. Hodge takes a lively interest in agricultural matters. He is President of the local Egg-Circle, and helps along the Farmers' Club. His son Clarence is Demonstrator for Richmond County.

A call was also made on Senator Pope. Although he has disposed of most of his farm land he still takes a keen and intelligent interest in farming, especially its importance as an industry in Canada. He is of the opinion that the railways are not doing enough to bring cheap farm produce to the city markets. They should be forced to give special rates and to put on special cars or trains for the convenience of the farmers going to the markets. If such were done farmers would make a better living and the city people would get better and cheaper provisions.

Mr. D. McIntosh and A. E. Raymond

One of the best farms in the Eastern Townships, if not the best, is the one belonging to Mr. Fred. Cromwell, M. P. for Compton Co. It is situated on the west side of the village of Cookshire and commands a lovely view over the surrounding country and the Eaton River valley. The buildings are modern and the farm is well cultivated. More than half of the 700 acres is under a four-year rotation. Mr. Cromwell is an enthusiastic farmer and has the best herd of Shorthorns in the Province. He showed us some very fine calves that certainly showed the best points of the breed. The 3-year old and the 2-year bulls are admirable types whichwould be hard to excel. We did not see the other feeding stock as they were out in pasture, but we believe the "Maple Grove Stock Farm" feeds about 200 head of cattle, 100 being pure-bred Shorthorns. In addition, attention is given to the breeding of Clydesdales of which twelve to fifteen fine animals are kept.

Home of Fred. Cromwell M.P., at Cookshire

For some years Mr. Cromwell has been trying out alfalfa as a fodder crop. His seeding this year looks promising in a field of oats, but if anything the oats are too heavy to benefit the alfalfa. He showed us an excellent field of ensilage corn—about 25 acres. His hay crop was below the normal this year on account of drouth in early spring.

The Maple Sugar Industry

The Maple Sugar industry is an important one in all the Eastern Township counties. Compton stands well up in the output of sugar and syrup. Statistics are not to hand for the last three years but in 1910 Compton County produced 611,240 pounds of sugar and 22,402 gallons of syrup. Nearly every farm has its sugar bush of 1000 to 3000 trees. The recent changes in method of manufacture, in the conservation of maple groves, and in legislation for the prevention of adulteration should have an important influence in the improvement of the industry.

J. A. McClary filling silo with a mixture of oats and vetches.—A common practice in the Eastern Townships.

Agricultural Societies and Farmers' Clubs..

Mention has already been made of the good work that is being accomplished by the Demonstrators in agriculture whose object is to get the farmers to co-operate more than they do, to undertake experiments in grains and methods of cultivation, and to foster agricultural education in the rural schools. In addition, the Agricultural Societies and Farmers' Clubs are doing a valuable work. Of the 128 Clubs in the Eastern Townships Compton has 18 and handled $5838 in connection with fairs etc. in 1913. These Clubs are fairly well supplied with lecturers from the Provincial Department, from the Dominion Agricultural Dep., and from Macdonald College. It was observed, however, that some of the Farmers' Clubs do not get the "Journal of Agriculture" through the neglect of the Secretary to send his list of members to the Secretary of the Council of Agriculture at Quebec. This oversight should be remedied at once for the members cannot afford in these days of progress to do without the valuable articles that appear every month in the "Journal of Agriculture".

Revival of the Sheep Industry

There are no better sheep-grazing areas than the hillsides of the Eastern Townships. Years ago every farmer had his herd of sheep, and they paid well too. Somehow or other neglect crept into their management and dogs began to worry them. As a result, sheep-breeding has practically disappeared.

In the last year or two an effort is being made to revive the industry which should never have been allowed to dwindle. Dog-laws are being revived for the protection of the sheep and the compensation of their owner. Associations are being formed for the better marketing of wool and the introduction of the best breeds of sheep. Experts are of the opinion that sheep-grazing would be one of the most lucrative side-lines of farming if it were only carried on properly. From present indications there is likely to be a great revival in the near future.

W. L.

CO-OPERATION

The Principle of Equality

Editor, Journal of Agriculture.—

THERE is a good deal of talk these days about co-operation, and many so called co-operative societies have been started. As a matter of fact there are in the strict sense of this term comparatively few truly co-operative societies in Canada. Most of them are in reality joint-stock companies, several of which may be a blessing in disguise for all that.

The fundamental principles in true cooperation are based upon equality, *equal rights* and *equal obligations*. The most important of these principles ples may be summed as follows:—

Corn-shocker used by J A. McClary at Hillhurst

1. Each man has one vote, and only one.
2. All members partake in the profits according to the degree in which they make use of their association, not according to capital insertedf
3. All goods must be sold or purchased through the society.

The first-mentioned principle — one man, one vote—is antagonistic to the old business custom which allows each man who enters as a partner to exercise his influence in proportion to his paid-up capital. In joint-stock companies the shareholders are supposed to vote in proportion to the number of shares they represent. And this system is, of course, quite legitimate where the dividend is apportioned to the stockholders.

It is, however, just the opposite in a co-operative association where the earnings of the business are divided,not proportionately to the capital, but allotted to each member according to the amount of business he has done within the organization. The profits, in other words, are divided amongst those who take the deepest and most real interest in the concern. The capital invested is only allowed a certain fixed interest, the rest of the surplus going to the consumers, or to the producers as the case may be.

Capital, under such conditions, is only the means to an end, and the end is, as it should be, the greatest good to the greatest number. Where capital has thus been put in its proper place, the poor man, who can afford to take only one share in the raising of working capital, has just as much interest in the welfare of the concern as his more wealthy neighbour who may have bought several shares.

The third principle, involving obligation sale or purchase through the society, is just as important as the two previously mentioned. The objection might perhaps be made that the associations should be able to keep their members together without such restrictions. But experience has taught that it is necessary to limit the freedom of the members in order to secure a fixed and steady turnover. Any man is liable to make some mistake, and even the most careful executive, of, say, a supplying co-operative society, may sometimes happen to buy a certain commodity at a comparatively high price. Feed stuffs or concentrates, for instance, are subject to rather sudden swings in the market, and the most skilful buyer cannot always predict which way the price may go.

Suppose now that a drop in the market occurs shortly after an association has bought its three months, supply of feed stuffs. Suppose further that the members are allowed to buy concentrates outside of their society.—What would happen? Firstly, the tradesmen would underbid the society, and secondly, some members—the weak-minded and the "smart" ones—would buy from the outside and leave it to the loyal members to pull through as best they can.

The application of these three principles, all based on the strictest equality, seems to go against the spirit of independence of many Canadian farmers. Anything that limits their freedom of action is repugnant, and in their over-eagerness to preserve their independence they entirely lose sight of the benefits to be accrued from true co-operation with their fellow men.

There are only two roads that lead to this kind of co-operation; one is called "Dire Necessity Lane"; the name of the other road is "Educational Avenue". Let us sincerely hope that Canadian farmers will never have to follow the first—mentioned road on which "Poverty" is a none too pleasant companion. But let us as sincerely wish that they will, of their own accord, take the second which leads through a beautiful country abundant in broadening views.

P. A. BOVING

AGRICULTURAL CONDITIONS IN HUNTINGDON COUNTY

THE summer of 1914 has probably been, in this part of the Province, the driest on record; from April till August there has not been at any one time sufficient rain to moisten the soil thoroughly. In consequence the hay and pasture crops have been very light. Throughout the district the hay crop will probably average less than half of a normal season. The grass was thin, and where clover came through it was generally short, due to the excessively dry weather. Much of the hay crop was injured by being left too long before cutting, in the hope that rain would come and the crop thicken up.

Pastures have been very short since the first of July, and stock has suffered accordingly; some few farmers, however, who had the foresight to sow some soiling crops, have had the value of soiling clearly shown to them, particularly for a dry season which is something always to be guarded against.

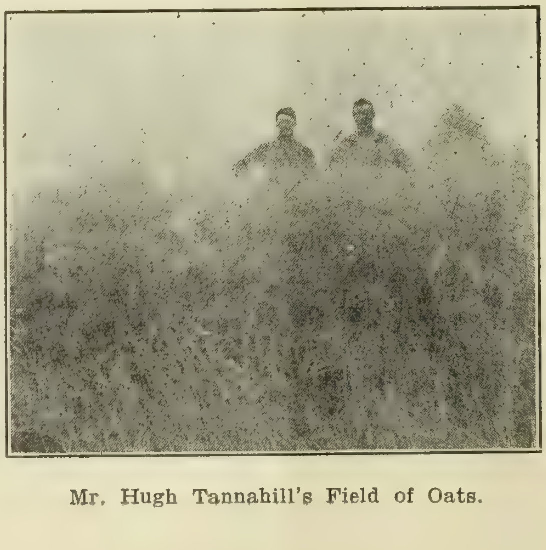
Alfalfa has this year demonstrated some of its possibilities as forage crop for this part of the Province. It wintered very well, and the second cutting was taken off about July 20th; some of the growers reported an average of 1½ tons per acre for each of the two cuttings, with of course the possibility of a third cutting. At any rate 3 tons of hay per acre is considered quite phenomenal for a dry season like 1914.

The grain crop, which at the time of writing is nearly ripe, is in general excellent. Grain that was sown in good time is far better than that sown later. In this county, however, there are some very heavy crops of oats, barley, and mixed grain, while a few good pieces of fall wheat and fall rye have been noted. Most of the farmers report their grain to be well filled, and with the quantity of straw it will be an excellent crop, and will help out to some extent the scarcity of hay.

There is, however, this year a very considerable quantity of smut, particularly on oats, and farmers of this section would do well to treat their seed oats before seeding next spring.

The corn crop is, generally, at least up to the average. Some of the farmers who were a little late in planting, and had not their land thoroughly worked beforehand, have rather uneven and in some cases poor crops. Others, who were more thorough in their cultural operations and got their seed in early, have excellent crops of corn; these farmers do not dread the shortage of hay. One of the best pieces of corn is on the farm of Mr. Hugh Tannahill, Trout River, his corn on Aug. 5th standing 8-9 feet high and in good growing condition.

This year's root crop in this district cannot be called an unqualified success; many of the root fields were not sown early enough to get a good start before the dry weather set in; consequently in many places the stand is rather poor, and the crop not very far advanced for the season of the year. However, we shall probably learn a lesson from this year's experience, and shall another year sow the roots as early as the land can be gotten into condition.



Mr. Hugh Tannahill's Field of Oats.

Owing to the great scourge of tent caterpillars this year's apple crop is small in this district. A few of the more advanced fruit growers of the district, who employed proper methods of spraying, were able to successfully combat the caterpillars as well as other pests, and have excellent sets of fruit in their orchards. This provides quite a good object lesson to their less progressive neighbors.

The market for live stock is dull; however, there have been considerable shipments of pure-bred cattle to western Canada and to the Eastern Townships which have helped to relieve this part of the country of surplus stock.

During this and the past year there have been in this district a great number of new up-to-date farm buildings put up, as well as considerable remodelling done. The planning and arrangement of some of these in truly excellent, notably the barns of MacMillan and Leggat, Trout River; John Logan, Allan's Corners; P. D. McArthur, North Georgetown; and D. T. Ness, Howick.

Farm help has not been so difficult to procure in this as in former seasons, due probably to the general commercial and industrial depression.

R. E. HUSK,

M. C. Demonstrator

SIGNS OF THE TIMES IN COMPTON COUNTY

AT this time when we hear so much of the hard times prevailing in the various parts of the country, it is quite refreshing to spend some time in considering a healthy and prosperous farming community.

Farmers as a class are probably as little affected by hard times as any class of people on the face of the earth. The farmer may complain about poor markets and such things, but at least he is never thrown out of work and can always grow enough, by judicious treatment of his land, to keep himself and his family most comfortably. The writer finds ample proof for the above statements by travelling around among the beautiful farms, which are found scattered so abundantly among the hills and valleys of Compton County.

The whole appearance of things suggests prosperity: the houses are comfortable and homelike; the barns are large and convenient; the flocks and herds are large and well kept; and the crops grow luxuriantly. These are the reasons which have induced me to term Compton County a prosperous farming community.

Compton County is also a healthy farming community. By this I mean that things are moving, not dull and stagnant. The farmers are not content with what they already know but are always striving to find out better and more economical ways of raising crops and stock. It is on this, the progressive phase of Compton County agriculture, that I wish to dwell for a short time.

Underdrainage is one of the things our farmers have their eyes on. By putting in a system of drainage they see that lands, which before could produce at best but a poor crop, are made to give splendid returns. They are quick to appreciate the generous offer of the provincial government, to have an expert make a drainage survey of their land free of charge. Already ten applications have been sent to the Minister and it is expected that many more will follow. Among the early birds in this regard may be mentioned George A. Hodge, Chas. Lefebvre, John Farnsworth, A. J. McIntosh, A. E. French, B. Lebourveau, W. French, and Chas. Nourse of Cookshire, E. C. Hemming of Sand Hill, D. J. Saunders of Bury and Gedeon Cote of Martinville.

Societies.—In the matter of organizations we are well advanced, having two Agricultural Societies and three good strong Farmers' Clubs. These clubs have all decided on a good program of work and lectures for the coming season. They also intend to take hold of the advantages of cooperative buying and selling wherever possible. The Scotstown club is a new organization and full of life. The Bury and Cookshire clubs, while of longer standing, are none the less active for this reason, but rather more so. On June 25th last the Cookshire Farmers'Clubs organized an excursion to Macdonald College. Unfortunately this was not largely attended, but those who did go feel sure that they derived a great deal both of pleasure and profit from the trip.

Clover Seed.—Another movement which is well worthy of notice is that of "Clover Seed Production". Agricultural Society No. 1. now owns a clover huller which is held at Cookshire for the use of the members. This season many have cut their clover fields early with the idea of later on harvesting a crop of seed. To anyone who realizes the ease with which weeds are spread in clover and grass seed, and the greater strength and germinating power of home-grown seed, the value of this crop will be readily apparent. It is also a direct saving, owing to the high price of clover seed.

Experiments of many different kinds are being carried on. Several fertilizer tests are being conducted with various crops in order to determine the ingredients most needed by the different soils. Mr. Chas. Lefebvre, near Cookshire, is conducting a variety test of ensilage corn, with a view of determining the most profitable sorts to grow in this section. Mr. John Farnsworth has an experiment in drilling *vs.* level culture with turnips; and Mr. F. R. Cromwell is experimenting extensively with alfalfa.

Weeds.—Some of the annual weeds are a source of much trouble to our farmers and to get over this several are trying the method of plowing shallow after haying, cultivating until fall and then plowing deeply. This method has proven successful at experiment stations and elsewhere and should prove a great help in the control of soil robbers.

Agriculture in this section, then, is in a prosperous condition. The prevalence of a hustling and inquiring frame of mind proves it to be in a healthy condition. We believe that a healthy prosperity will make for still greater prosperity and that this will be brought about in the near future

A. E. RAYMOND,

Demonstrator

HARVEST NOTES FROM RICHMOND COUNTY

THE present writing is just at the close of the busiest season of the year for the farmers of this district. Hay is the principal crop here and nearly all of it is harvested. The crop as usual varies greatly, some men claiming that they have harvested a larger crop than usual; while others say that the crop is lighter. The general opinion, however, seems to be that though the earlier months of the season were very dry and checked the growth severely, yet the fairly heavy rains during the latter part of June and early July brought the hay crop up to a little above the average of the last few years.

This is especially true of land that had been recently seeded down. The newly seeded clover and timothy meadows gave very much better returns than the older meadaws where Red Top and June Grass were chiefly in evidence. No better evidence in favor of a short rotation could be found than is to be seen in a study of this year's hay crop on newly seeded land as compared with that on land which has been down to grass for a number of years.

Grain in this vicinity is just on the point of turning and before many weeks the binders will be in motion once more. It is a little early to judge what the yield of grain will be, but there is a fairly good growth of straw, and if it does not ripen off too rapidly the heads should fill nicely.

Smut in the grain is not alarming this year, yet in several cases the writer has observed fields in which a little time spent in applying the formalin treatment to the seed would have resulted in an increase of several bushels to the acre and considerably lessened the discomfort of threshing.

Potatoes are going to be the banner crop of the year if one may judge by present appearances. As usual the potato beetle is abundant, but liberal doses of Paris green have prevented serious damage. It is too early in the season to determine the amount of damage that may be caused by the late blight. Spraying with Bordeaux to prevent loss from this disease is not a common practice in this district, in fact the only application the writer has heard of, is one that is being carried on as an experiment under his own supervision.

The corn and root crops pretty nearly balance each mother. The cold nights have checked the growth of the corn so that in most cases the crop will probably be a light one. Roots, on the other hand, have apparently benefited by the coolness and especially by the frequent showers of early July so that they promise to make up for the deficiency in the corn.

Fruits of nearly all kinds adapted to the district are plentiful and are being enjoyed by all.

Since the above report was written, news has come in of a very destructive hailstorm. This storm is the worst that has been experienced here for many years. It covered an area of about three miles wide by thirty miles in length, and so sharply were the edges defined that one man's crops were ruined while his neighbours' were scarcely touched. It is impossible to estimate just how much damage has been done, but many of the farmers are putting their mowing machines into their grain fields where nothing but the green straw is left and even that is badly broken down. Corn and potatoes have only the bare stems left and in root fields it is almost impossible to distinguish the rows. Fortunately the hay crop was practically all harvested so that there is something left to fall back upon.

Richmond, Aug. 10 1914 C. H. HODGE

Demonstrator

ONE MAN'S EXPERIENCE NOT ENOUGH

WE were much amused upon a certain occasion at a remark made by a retired minister regarding a certain farmer sending his son to the agricultural college, and yet there are a great many farmers good, bad and indifferent scattered here and there over this country that hold views very much like the prejudiced old parson who saw very little in farming more than work and worry over big crops and small. Here is his view of an agricultural education. There is a great deal contained in the one sentence—"John, what in the world do you want to send that boy to the agricultural college for? Can't you teach him how to farm?"

John had made a very good success of farming and was considerably more of a practical man than a theorist, yet his practical experience and lack of scientific knowledge did not bias his mind or prejudice it against higher agricultural education than that which good fields and good stock afford. His reply was short and to the point. "Yes, I can teach him how to farm, but there is much more to be learned about the occupation than he can ever learn from me. He has a very good practical ground work to keep his head level enough to weigh the merits of the theories expounded by the scientific men, and by picking the good from my teaching and from theirs he should be placed in a fair position to go on and do something at this hard old game of farming. I have worked hard all my life; maybe he will learn to use his head more to help his hands".

The trouble with too many farmers is that they are always looking for something to criticise in the efforts of others, especially of those whose work deals with the scientific end of the business. They have been good, practical, hardworking farmers for years, and, to their credit, have made a financial success of farming. These men are never easy to convince that new methods are more to be depended upon than the old tried ways which have brought them returns, and prefer to cling to their own rather than listen to others. These are the men who must be shown and sometimes convinced against their wills. They may have missed many opportunities through being too busy to think, but work is uppermost in their minds, and most of their thinking is done during the few minutes it takes them to drop off to sleep at night. There is no doubt but that more money is lost yearly on many places because more up-to-date methods, the result of thought, are not brought into play. There is no use in any of us thinking that because we have had years of practical farm experience,and have made, by hard work and close saving, a few thousand dollars that there is no more agriculture for us to learn. It is a subject the depths of which will never be fathomed, and the wider knowledge, practical and scientific, men young and old get, the better will they be equipped to make a success of it. It is not to boost agricultural colleges that we write, but it is to impress upon readers the importance of recognizing in the calling a big work for a big man who cannot afford to let an opportunity slip past of adding to his knowledge. In short, no man knows it all about farming; most of us know comparatively little, and we should make the best possible use of our colleges, institutes, representatives, bulletins, live stock branches, fruit branches, and all the many aids to a wider knowledge of the greatest subject in the curriculum.—*Farmer's Advocate.*

WATER IN CELLAR

Editor, Journal of Agriculture:—

IN the spring water fills my cellar up one or two feet. Can you tell me how to prevent this?

Ans. To keep water out of the cellar put in a tile drain all around the house. Put it four or five feet from the house and make it one foot deeper than the bottom of the cellar. Give this a good slope to the lowest side. Use 3 in. field tile. Place them end to end and do not cement the joints. Give this drain a good outlet.

C. J. L.

SURFACE WATER IN WELL

Editor, Journal of Agriculture:—

I have a well eight feet deep. I am bothered with surface water running into it in the spring and after a heavy rain. Will you please tell me how I can keep out the surface water ?

A. J. M., Quebec.

Ans. There are a number of ways in which you can keep out surface water.

One way of doing this is to line your well with concrete for the upper ten feet. Make the concrete six inches thick. Run this lining up 1½ ft. above the level of the ground. Give the inside a coating of good strong cement.

LIVE STOCK

DISTRIBUTION OF RAMS AND BOARS BY THE FEDERAL DEPARTMENT OF AGRICULTURE

As the distribution of pure bred stallions and bulls, 125 and 414 of which respectively have been located in different parts of the Dominion, has now been completed for the current year, it is announced that the Live Stock Branch of the Federal Department of Agriculture will undertake a further distribution of pure bred rams and boars during the months of August, September and October next, to associations of farmers organized in districts in which the services of satisfactory breeding animals in these classes are not already available. Applications for rams and boars, a large number of which have already been received, should be made at an early date, as it will not be possible to consider those that are not made prior to October 1st. Farmers desiring to secure the services of such stock should arrange to organize an association in their district and forward their application to the Live Stock Commissioner, Department of Agriculture, Ottawa, from whom application blanks and all information with respect to the conditions under which pure bred sires are distributed, may be obtained. It is understood that all applications will be reported upon by officers of the Live Stock Branch and that favourable action as regards any application shall be subject to the approval of the Live Stock Commissioner. Letters addressed to the Department do not require postage.

TWO NOTED STOCK FARMS AT ORMSTOWN

Ormstown in the county of Chateauguay is well-known as the site of the Spring Show of the stock-breeders of the Beauharnois district. Two of the most famous live-stock farms of the district are in the immediate vicinity of Ormstown. We refer to the farm of Mr. Neil Sangster, and the Ormsby Grange Stock Farm owned by Dr. McEachran. A few pictures of stock from these two farms are shown in this issue.

Holstein Bull
Gano Faforit Posch 11910. Property of Mr. Neil Sangster, Ormstown.

In spite of his modesty Mr. Sangster is widely known as one of the most skilful breeders of Holstein cattle in the Dominion of Canada. On his farm of 150 acres are to be seen some of the no-

---

Sanitary experts state that water should penetrate at least ten feet of soil before entering a well. Your well is only 8 ft. deep. We advise you to make it 12 ft. deep and line the upper ten feet as above. Put a good tight cover on the top of the well to keep out insects and dirt.

Another way is to put a foot of gravel in the bottom of the well. On this put glazed drain tile. Run this up to 1½ ft. above the surface. Cement the joints. Fill in around the tile with clean soil. Make the soil slope away from the tile. Put your pump inside the tile.

Another way is to put in an iron pipe four inches in diameter, with a screen at the bottom. Fill the bottom of the well with gravel to about one foot above the screen. Fill above this with good clean soil. Make soil slope away from pipe at the surface.

Still another way is to use the ordinary stone or brick lining. Carry it 1½ ft. above the surface. Behind the lining tamp in a layer of puddled clay one foot thick. The puddled clay will keep out the surface water.

C. J. LYNDE

HYDRAULIC RAM

Editor, Journal of Agriculture:—

We have a spring which gives enough water to fill a 3" pipe. We can get a fall of eighteen feet. The total lift will be 76 feet to top of elevated tank. We wish to supply water to three houses. Can we use a hydraulic ram. If so, what size ram, size of pipes, etc., and what will be the cost ?

L. M., Que.

Ans. A hydraulic ram can be used under the above conditions, and we would recommend the No. 6 ram, price $40.00. This ram would furnish from 65 to 100 gallons per hour. To operate under the above-named conditions the water fall should not be less than 10 feet and the drive pipe would require to be 2½ in. in diameter and 50 ft. long. The discharge pipe should be 1¼ in. A smaller size of ram and piping could be used, but the water delivered would be correspondingly less.

The cost of galvanized iron pipe 2½ in. is 21½ cents per foot; 1¼ in. is 8½ cents per foot.

The ram should be protected from frost. In any case we would advise calling an expert to supervise the work, as it is most important that the ram be properly installed.

C. J. L.

HOME-GROWN CLOVER SEED

With Care Excellent Results may be Obtained—Methods of Cutting Explained

Under normal conditions the second crop of clover should be cut for seed when the heads have turned dark brown and when most of the seeds are in the stiff dough stage. It is not advisable to cut the clover when the seeds are soft, expecting them to ripen after the cutting, as light shrivelled seed is likely to result. Give the seed a chance to fill properly, even if a few ripe heads are lost. This loss may be materially reduced by cutting either early in the morning or late in the evening; there will be little shattering when by reason of the dew the straw is less brittle. If the clover is tall enough it can be cut very conveniently with the binder. The cord should be removed, and the trip and the boards that hold back the sheaf, should be slackened or removed to allow the clover a free course to the ground. In this way the clover will be laid in a light windrow out of the road of the horses on the next round. When ready, it can be gathered easily with the barley fork. The old-fashioned reaper is sometimes used, or, if the crop is short, the mower will be suitable. A flat board table may be attached to the back of the cutter bar, after having a couple of holes drilled in it. The clover is kept back from the bar and raked off into windrows by the man following the machine.

The clover must be thoroughly dry before threshing. If threshed in the field, it should be left until the dew is gone; the same course should be followed if it is to be hauled into the barn to be threshed later on. If a clover huller is available, the threshing is a simple matter. If, however, there is no huller in the neighbourhood, grain threshers may be used, some of which have a clover attachment. If necessary, the ordinary machine can be adjusted to do fairly clean work. First, the clover should be run through, as in grain threshing, to separate the heads from the stalks and hull part of the seed. Next, fasten a piece of sheet iron in firmly, directly behind the cylinder, to close up all of the back except eight or nine inches at the left end, and close the front, except a foot at the right end. Close also any openings in the concaves. The object is to make the short material pass from one end of the cylinder to the other in order to remove the seed. The chaff can be put through again, if necessary.

Conservation

THE 1914 WHEAT CROP

The following table contains the official estimates of the production of wheat in 1914 compared with that in 1913 in the countries so far reported to the Institute.

Country	1914 Bushels.	1913 Bushels.
England and Wales	56,448,000	53,137,000
Belgium	13,973,000	14,769,000
Hungary	133,504,000	168,249,000
Spain	120,314,000	112,402,000
Italy	172,697,000	214,407,000
Luxembourg	654,000	644,000
Russia-in-Europe	687,434,000	837,795,000
Switzerland	3,469,000	3,509,000
United States	930,000,000	763,380,000
India	313,040,000	364,000,000
Japan	23,843,000	25,207,000
Total	2,455,376,000	2,557,499,000

The above countries produce about two-thirds of the world's wheat crop. The chief producing countries yet to report, outside of Canada, with the final estimates of their wheat production last year are: Germany, 171,077,000 bushels; Austria, 59,626,000; France, 319,373,000; Roumania, 84,192,000; Russia-in-Asia, 189,864,000; and Algeria, 36,848,000 bushels. The crops of the countries of the Southern Hemisphere, of course, cannot yet be considered.

The chief features in this year's crop are the great increase of 166,000,000 bushels in the United States and the decrease of 150,000,000 in the crop of Russia-in-Europe. Most of the other European countries also show large decreases. Reports from official and private sources point to decreases in the crops of Austria, Germany, France, and Roumania. Judging from the reports now available, the total world's crop of 1914 will probably be smaller than that of 1913.

T. K. DOHERTY,

Canadian Commissioner,

Int. Inst. Agriculture

Group of Holsteins
Property of Mr. Neil Sangster, Ormstown.

blest specimens of this great dairy breed. The herd amounts to about sixty head. The group of cows shown in our picture includes the famous Rhoda's Queen and some of her daughters. The bull, Gano Faforit Posch, 11910, the present head of Mr. Sangster's herd, is sired by Gano's Faforit Butter Boy, a bull with six tested daughters. The dam of Gano Faforit Posch, Daisy Posch, has a seven-day record of 663 lbs. milk and 29.01 lbs. butter, and a thirty-day record of 2709 lbs. milk and 117.90 lbs. butter.

Countess of Afton (imp.). Sire "Marmion"

Dr. McEachran, who has spent a busy life as a veterinarian, teacher and stock-breeder, is still prominent in the latter capacity in his retirement on the banks of the Chateauguay. Across the road from his handsome residence, which commands a charming view of the Chateauguay valley, is a farm of two hundred acres which provides sustenance for about thirty horses, as well as for a small herd of Jersey cattle. The horses are chiefly Shires and Clydesdales. Our pictures show two of the most famous of the Ormsby Grange Clydesdale mares, and one of the stallions. The imported mare, Countess of Afton, is a particularly fine type of mare and one with an enviable show record, including first prize at Perth as well as first for mare bred by exhibitor, and the Harviestown Challenge Cup as a two-year-old; fourth at the Highland at Peebles, and third at the Highland at Aberdeen; first at Creith and Perth as a brood mare; and first at Ormstown this year. The other mare, Fyvie Time, won third place at Ormstown this year. The stallion, Favorite Tone, imported, is a son of Baron of Buchlyvie, a horse which sold for $47,500.00. Favorite Tone took first place at the Montreal Horse Show last spring.

Fyvie Time. Sire, Baron Beaulieu, 3rd at Ormstown

Favorite Tone (imp.). Sire, the $47,500, Baron of Buchlyvie

HEREDITY AS AN INFLUENCE IN MILK PRODUCTION

An address to the Ontario Live Stock Associations by H. Barton, Professor of Animal Husbandry, Macdonald College, Que.

THE subject assigned to me this evening seems peculiar on this programme. While it is very old, having been recognized and studied for centuries, it is also very new, particularly to the stockman, because by him it has been very imperfectly understood and appreciated only to a limited extent. Some one may say there has been little to interest him, for even the scientist has been groping in the dark. The last few years, however, have brought something to light and a promise of something which should result in bringing this subject nearer home to the breeder. In our records of milk production alone, while not yet extensive, there is already sufficient information available to give us at least an intelligent interest in the operating of this mysterious force called "Heredity" in so far as how it seems to behave in the quality of giving milk. Someone has said that the question of heredity is as limitless as the forms of life in both plant and animal. I assure you it is not my intention to cover the subject in the time at my disposal; and I wish to make it clear that in my discussion of heredity in relation to milk production, I shall make no attempt to treat the technical side of the question, nor do I hope to disclose any of the mystery in which the working of this force is shrouded. My remarks will be of a very elementary character and for the most part a review of a little information already published.

When this subject was suggested to me, I fully realized that it was an exceedingly difficult one to treat in a limited time in such a way that the average man would get anything out of it. However, I was very much pleased that the Winter Fair authorities should place such a subject on their programme, because while for the practical live stock breeder only a commencement has been made thus far in deducing definite information, sufficient progress has been made, particularly in the last few years, to merit his attention. I shall, therefore, attempt to place you in touch with a phase of the subject being studied in reference to milk production, and to give you some of the information thus far obtained.

I am perfectly aware that many breeders for many years have known and worked on the assumption that there is a tendency to transmission of likeness from one animal to another, in fact this has been the corner stone of progressive breeding. I have seen and heard this statement throughout my time, in the press and from the institute platform, but the one fact that there is a tendency toward this reproduction of likeness has been, for the most part, the extent of the information.

In regard to what extent the tendency holds, how it may be affected by various members in the ancestry, the age of the parents, the degree of development of the character involved, violent outcrossing and various other factors which are frequently a part of breeding, not very much has been said. Certainly we may look for more from this out. The subject as it stands was given to me by those in charge of the fair, and the very fact that it should be worded as it is, "Heredity as an influence in milk production," is significant. It suggests an ambition to distribute and apply whatever knowledge there may be available on transmission for this particular work. This looks like a new departure in subjects and a fresh appreciation of a subject that has usually been considered to belong to the scientist only.

WHY SO LITTLE IS KNOWN ABOUT HEREDITY IN MILK PRODUCTION

We, in Canada, are hardly as keen in many ways (perhaps I had better qualify it) as our American friends across the line, where for some time they have been searching their mass of records in quest of some understanding as to how this tendency of transmission was working in milk production as shown on their record books.

At the meetings of the various Breeders' Associations during the past year or two the information obtained has been given to the breeders.

Two great reasons why we do not better understand more of the working of heredity with dairy cattle, or any other class of live stock, are because while some of our breeds are of long standing our records are very imperfect, and those which are available have not been fully studied. We have a rare opportunity in this work with dairy cattle for the reason that very definite records can and have already been made; and moreover they are official and authentic. There is just this to add, however, in reference to our present situation, the work is somewhat new for a study of transmission, for while it is true official records have been compiled in Canada for some years, yet when we consider that three years, at least, are required before progeny can be recorded, and that these records naturally started in a small way, it is apparent that they must necessarily be yet quite incomplete in this country. Our advanced registry, for instance, is only about five years old, so that very little is available in the transmission of dairy qualities. The cows registering in the first few years, you will understand, will not have their ancestors registered, and on the other hand these in turn are only beginning really to have progeny registered. However, each year this work is becoming more general and widespread and each year a new generation, larger than any preceding, is added and in a short time we shall have a fertile and valuable source of information on the behavior of dairy qualities in transmission. We have, all told, in the Canadian Holstein-Friesian record of merit, 829 females and 53 males recorded. While these are very few in comparison with what the American Association has to work on, they offer some suggestive information.

I had thought perhaps some reference to our own records might be of some interest, and with the hope of arousing a little ambition to study them more closely I have planned to give you some of the evidence they furnish in addition to some facts revealed by the American records by American authorities. We must remember, however, that our Canadian records are only commencing to be fairly representative.

The common mistake in the past has been in making too much of the individual, and not enough of its complete ancestry, as well as the whole race or group to which he or she may belong, in attempting to draw a conclusion in breeding. There is no doubt a greater tendency to do this with animals, because the number in comparison with plants, which can be easily controlled, is necessarily limited, and time and expense involved are—of course—much greater. The principles of heredity will hold for the majority, and if a man knows that in the majority of cases certain results will be the outcome of certain practices, that by breeding from a certain class of animals he is likely to obtain in the majority of cases what he desires, and if on the other hand he ignores certain considerations he is likely to meet with disappointment. If he is able to relate practice with result, cause with effect, even in the majority of cases, with some confidence, he is able to operate inteligently and adopt in so far as possible a progressive policy. He may also have some chance of understanding his disappointment.

The reason why he cannot guarantee himself favorable results in every case is because while "like produces like," as the old saying has it, there are many cases in which like produces very unlike; in fact no two individuals are exactly alike, as any breeder can testify. There are always more or less extreme variations, in other words good cows may and do produce poor cows occasionally, and in some cases poor cows may produce good cows, but these are the exceptions, and not in accordance with the principles of heredity which will hold for the majority, and the larger the number considered the more exactly will the laws of heredity operate.

STUDY OF AMERICAN HOLSTEIN RECORDS

Now, then, let us notice some of the compilations that have been made. Professor Davenport of Illinois, who was one of the first to investigate records, has published a table from the American Holstein-Friesian records with which we would do well to familiarize ourselves. Many records have been made since the table was compiled, but it includes 608 mature cows, and there is no reason to believe but that the facts brought out would be even more fully established were the additional records included.

This table includes mature cows and their offspring when mature and with records ranging from 11 to 28 lbs. of fat in 7 days.

The general average of the dam was 15.368 lbs
The general average of the offspring was 15.316 lbs

Among other things, the table shows variations conspicuously; for instance one 16-lb. cow and one 20-lb. cow were produced by 11-lb. cows. Of course good bulls were used on all those cows; they would vary, but the whole number would average as good bulls. One 24-lb. cow was produced by a 14-lb. cow, on the other hand one 23-lb. cow produced one 12-lb. cow, and one 20-lb. cow produced one 11-lb. cow.

However, taking all the cows below the average, there is a tendency for these cows when mated with good sires, some of which were undoubtedly superior to themselves, to produce cows better than themselves, or cows more nearly the average. With cows above the average there is a tendency for them when mated with various bulls to produce cows a little below themselves and more nearly the average. All of which goes to show that it is easier to bring cows up to the average than it is to take them beyond it; the farther above it they are the more difficult will it be to maintain the standard. This explains as well why we are often disappointed with the offspring from phenomenal cows. In the first place they are difficult to mate with a bull of equal merit, and in the second place in any case there is a tendency in their progeny to fall nearer the average.

However, this also is shown: The majority of good cows are from those above the average, the majority of poor cows are from those below the average, and the better our cows are uniformly the better will be their progeny, although on the average they will likely fall below their dams, unless the bull has been of superior merit.

This table also teaches another thing: the man who has two or three cows with phenomenal records who is selling all his calves on the strength of these records is not doing the breed any good, because in every herd and from every class we may take it for granted there are going to be both good and bad, and no matter what standard we have reached we must keep culling and weeding out those poor variants that are bound to appear. No man, therefore, can sell or buy the individual on the strength of the breeder's or herd's reputation alone.

M. A. Harper, of Cornell, has more recently published some data gathered from the advanced Register. His work included 3,070 cows. These he classified as follows:—

	Number	Percentage
Both sire and dam in register	1,196	39
Neither sire nor dam in register	710	23
Sire in register, dam not in register	770	25
Dam in register, sire not in register	394	13

Harper remarks that the minimum requirement is not difficult to make, that records in the register vary a great deal, and that there are many cows outside the register capable of making it, so a register's real efficiency will not be apparent until the cows are classified on a basis above the requirement. Classifying them on a basis of 50 per cent. above requirements and also 100 per cent. above requirements, the above percentages gradually change to the following in the case of the cows doubling the requirement or making 100 per cent. above it.

	Number	Percentage
Both sire and dam in register	123	73
Neither sire nor dam in register	5	3
Sire in register, dam not in register	25	15
Dam in register, sire not in register	15	9

It will thus be seen that 73% of the cows in this class have both sire and dam registered, while only 3% have neither registered.

In classifying bulls on the basis of the number of daughters they have registered, his lowest class, those with nine or more A.R.O. daughters including 28% of the sires—58% had sire and dam registered, and 12% had neither sire nor dam registered. As the number of daughters was raised the percentages again gradually changed until in the case of the sires, of which there were only five or six per cent. with 75 A.R.O. daughters or more, 100% in every one of these had both sire and dam registered. And, of course, none had neither sire nor dam registered, although this was the case when the twenty-five daughters class was reached.

(To be continued)

A CLYDESDALE IMPORTATION

ROBERT Ness, Howick, Quebec, has bought five superior Clydesdales from the noted firm of A. & W. Montgomery, Netherhall and Banks, Kirkcudbright. There are two colts and three fillies, and all are two-year-olds. Baron Strathaven (17752) was bred by A. Todd, High Crewburn, Strathaven, and was got by the world famous champion Baron's Pride (9122), out of Blossom VII. of Drumlanrig (28345) by Montrave Mac (9958). Breeding of this description always costs money, and in this case it is in combination with the best of individual merit. Baron's Pride seems to have left a large proportion of exceptionally good horses and mares in his later years. Baron Strathaven has plenty of size, his frame is of the compact deep-ribbed order, his legs are about all that could be desired, with flat flinty bone, and good wide feet, and he moves straight and true both coming and going from one. In Canada he cannot fail to make his mark.

The other colt is Boreland Crest (17785), bred by James Richardson, Boreland, Glencaple, Dumfriesshire. His sire is the grand, big horse Scottish Crest (13182) which has been very popular with breeders of weighty stock, and he is out of the grand old mare Ella, by the handsome sire Elator (10340). This is a good weighty colt of pronounced quality which should breed the best class of heavy draught stock.

The two-year-old fillies are just the kind in demand in the Dominion, of good lineage, and up to plenty of size. Carleton Fanny was bred by James C. Barber, Carleton, Kirkcudbright, and her sire is the prize horse Prince Sturdy (10112), bred in the United States of America by the late Colonel Holloway, while her dam is Fanny Scott (26031) by the good breeding stallion Royal Scot (11179). She is a filly with a good top, fine depth of rib, clean legs with flat, flinty bones, springy pasterns, and wide open feet.

A right good filly is Auldbrick Flora, bred by James Morton, Auldbrick, Whithorn, Wigtownshire. She is by the Highland and Agricultural Society first prize horse Fyvie Baron (14681), now making history in Canada, out of Jean of Auldbrick (30192) by the great prize stallion Pride of Blacon (10837) which gained numerous honors at shows in England and Scotland, including those of the Royal Agricultural Society and the Highland and Agricultural Society. She is thus not only descended from stock which has been distinguished in the leading exhibitions of the United Kingdom, but from animals of outstanding quality and great size. Auldbrick Flora is a filly with a grand outlook, thick through her body, and standing on the best of legs and feet. She moves gaily and true.

(Continued on page 60)

AUCTION SALE

— OF —

200 SHEEP, 100 SWINE AND 75 CATTLE

(Males and Females) All Pure Bred and Registered

ORGANIZED BY THE

GENERAL STOCK BREEDERS' ASSOCIATION

OF THE PROVINCE OF QUEBEC

UNDER THE PATRONAGE AND WITH THE FINANCIAL HELP OF THE

Hon. J. E. CARON, Minister of Agriculture of the Province of Quebec

AT MONTREAL

At the East End Cattle Market

(CORNER OF FRONTENAC AND IBERVILLE STREETS)

At 10 A. M.

Thursday, 8th October, 1914

AT QUEBEC

On Exhibition Ground, At 10 A. M.

WEDNESDAY, 14 OCTOBER, 1914

The animals offered for sale will be registered in the Canadian National Records. There will be some Canadian, Ayrshire and Holstein cattle; some Leicester, Cotswold, Lincoln, Shropshire, Hampshire and Oxford sheep and some Yorkshire, Berkshire, Chester and Tamworth swine.

CONDITIONS:—Cash, except to Farmers' Club and Agricultural Societies which will be allowed time on terms that will be given by the Department of Agriculture of Quebec.

Purchasers assume all responsibility from the moment the animals have been adjudged to them. For further particulars apply to:—

J. A. COUTURE, Secretary of Stock Breeders' Association

49, GARDEN STREET, QUEBEC.

THE DAIRY

QUEBEC CHEESE IN ENGLAND

Extract from a circular letter of Messrs. W. Weddel & Company, Limited, London, Eng.

QUALITY.—There is generally not much comment to be made about the quality of Canadian Cheese. It will be remembered that the autumn of 1912 was wet in Canada and the cheese did not keep as well as usual in consequence. Last autumn, however, the quality was up to the usual standard. The Government of Quebec have for the past five years taken a special interest in the Cheese Industry of that Province, and are giving grants towards the building of up-to-date factories and the educating of Cheese makers in the latest and best methods of manufacture. In 1913 there was a distinct improvement in the quality of a great portion of the Quebec Cheese output, and one of the Associations there, which handles nearly 5,000 tons, is making special efforts to bring its quality up to that of the best Ontario Cheese. As a general rule the cows in Quebec give richer milk than those in Ontario, so that there is no insuperable reason why it should not be made into better cheese.

SUMMARIES OF DAIRY RECORD CENTRES

May, 1914

Herds	Cows	Cows Centre	Lbs. Milk	Test	Lbs. Fat
		ONTARIO			
26	230	Alexandria	834	3.4	28.3
58	532	Avonmore	781	3.4	26.5
52	496	Cornwall	734	3.6	26.8
47	388	Farmers Union	848	3.3	28.5
62	445	Frankford	1017	3.4	34.4
47	492	Hallville	819	3.4	28.0
11	127	Ingersoll	1151	3.1	36.4
33	339	Kingston	979	3.3	32.3
54	437	Listowel	1005	3.2	32.9
29	317	Mallorytwn	864	3.1	27.4
50	374	North Gower	825	3.3	27.2
36	256	Perth	886	3.3	29.2
54	404	Peterboro	941	3.2	30.7
41	314	Renfrew	890	3.3	30.1
18	113	Sunderland	848	3.7	31.4
618	5264	Average	881	3.3	29.6
		QUEBEC			
66	341	Montmagny	594	3.1	18.7
36	242	Shawville	699	3.4	24.2
32	154	St. Aubert	556	3.6	20.0
23	133	St. George	596	3.6	21.7
34	198	Ste. Henedine	592	3.6	21.3
55	442	St. Hyacinthe	741	3.5	26.3
46	375	St. Prosper	631	3.4	21.7
17	70	St. Raphael	606	3.4	20.9
64	707	Ways Mills	707	3.7	26.4
373	2662	Average	661	3.5	23.4
		NEW BRUNSWICK			
42	166	St. Joseph	494	3.6	17.8
38	397	Sussex	663	3.8	25.6
80	563	Average	614	3.7	23.3
		NOVA SCOTIA			
25	116	Antigonish	478	3.6	17.2
1	4	Clare	537	4.1	22.2
40	87	Meteghan	425	4.1	17.4
48	257	Scotsburn	626	4.1	25.8
61	347	Truro	583	3.9	23.0
175	811	Average	565	3.9	22.4
		PRINCE EDWARD ISLAND			
30	99	Crapaud	801	3.3	26.4
15	57	Kensington	803	3.6	29.1
45	156	Average	802	3.4	27.4
		SASKATCHEWAN			
23	104	Lloydminster	615	3.6	22.1

The other young mare is Balmangan Belle, bred by W.P. Gilmour, Balmangan, Kirkcudbright. She has for sire the big popular premium horse Iron Duke (13535), and her dam is Kate of Frostrie (16100) by The Raider (11561). Here, too, we have a filly of substance and quality with lots of true Clydesdale character. She is a good mover, and looks like a mare which will breed large-sized stock of the right quality. It is to be hoped that Mr. Ness will have the best of luck with this consignment. He is one of the veterans of the trade, and deserves success. — *Canadian Farm.*

ROPY MILK

Nature of Trouble

IN the last issue of this Journal I spoke in passing of some of the troubles which from time to time arise in the dairy, due to infection by undesirable and injurious bacteria.

For the present we will confine ourselves to a consideration of ropy milk—or, as it is often called, slimy milk.

The farmer who is engaged in the production of milk for sale, the wholesale dealer whose establishment in the city deals with hundreds or mayhap thousands of gallons of milk per day, the retailer, and lastly the householder, should have some knowledge of this particular trouble.

That ropy milk is harmless to health is commonly known; in fact it is recorded on the highest authority that in some countries, notably northern Sweden, milk thus infected is regarded as a delicacy, and by many people in that and other countries it is used in much the same way that the Bulgarians follow in their time-honoured custom of drinking milk soured by the *Bulgaricus bacilius.* In Sweden the milk so used is inoculated by means of the Butterwort plant, *Pinguicula vulgaris.* The leaves of this plant are infested with an organism which brings about the ropiness.

That, however, which is the boon of the few is the bane of the many; and of all the troubles of bacterial origin which at various times appear in the dairy, none is more persistent, none more likely to cause alarm to the consumer and incalculable monetary loss to the producer and purveyor, than ropy or slimy milk.

Its occurrence renders the product useless as a market commodity, thus entailing absolute loss as well as considerable inconvenience.

Scientific Investigations of Ropiness

The literature on the subject is prolific; and exhaustive treatises have been published by many investigators on this continent and in Europe.

One of the most important of these was published in the "Revue Generale du Lait" in 1905, by the present Principal of Macdonald College, Dr. F. C. Harrison, in which a review of the historical aspect of the subject is given, in addition to a detailed account of investigations carried out by the author at the Ontario Agricultural College, Guelph.

In the English 'Board of Agriculture Journal' of March, 1912, a valuable paper is contributed by John Golding, now of the Government Dairy Research Station, Reading, England.

In June, 1909, the Rhode Island Experimental Station published a Bulletin discussing a similar trouble which at that time appeared in the northern part of the State.

Ademetz, Duclaut, Weigmann of Kiel, Ward of Cornell University, Marshall of Michigan, and numerous others have given us the results of their researches, the sum total of which serve to prove beyond doubt that the initial causes of ropy milk are no respecters of continent, country, district or dairy.

Sources of Infection

It is not my purpose here to enter into a scientific dissertation on the subject in hand, but rather to present a few observations and conclusions which it is hoped may assist the layman in a diagnosis of the trouble, and point out the way of salvation.

If milk is ropy, no scientific proof of the fact is needed; a spoon or wire, dipped in and then taken out, draws after it long thread-like strands often more than a yard in length; such milk partakes somewhat of the consistency of thick treacle, and the manner in which the threads draw out reminds one of the time-honoured Canadian custom of 'sugaring'. Occasionally the udder of a cow may contain organisms which will cause the trouble, but usually the infection resulting in ropy milk takes place after the milk has been drawn from the cow.

It may be noted that when the organism causing the ropiness is traced back to the udder of the cow, the milk thus inoculated is not fit for consumption; but as already stated, with this exception, ropy milk caused by bacteria is not injurious to health.

Many organisms are capable of producing ropiness, but as the infection is almost always subsequent to milking operations the farmer or dairyman is in a position to exercise control, and by prompt and efficient means rid himself of the trouble.

The air of the cowshed frequently reveals a cause of ropiness, and where this has been the case a careful cleaning of the stable, the eradication of old dusty timber and thorough whitewashing throughout have successfully put a stop to the trouble.

Straw, litter and dust are said to be the means of carrying the organisms, but one of the most common sources of the bacteria responsible for ropiness is water. Infection is not caused by the passing of the water through the system of the cow, but by reason of the fact that the organisms in the pond, river or drinking trough are carried into the cowshed on the hairs and skin of the animal, and during milking fall with the dust into the milk pail.

The importance of having clean cattle, and damping the flanks and udders during milking cannot be over estimated; for if these measures are taken much risk is obviously avoided.

The washing of the dairy utensils should not be done with water of questionable purity, for in some cases the infection has taken place at this stage: milk thus being inoculated the moment it comes in contact with the pails and other vessels.

A Typical Case

At the College in England with which I was formerly connected numerous cases of ropy milk had been reported from various parts of the country for many years. In the spring of 1911 a persistent outbreak occurred on the farm of a dairyman supplying milk to one of the large cities in the midlands. As this was a typical case, and I was detailed to investigate it, one may be pardoned for referring to it, in view of the fact that the knowledge thus obtained was first-hand.

A visit was paid to the farm and samples of milk taken from (a) individual cows, (b) the milk of the herd before and after straining, (c) the water from which the cows drank, (d) the water used for washing the pails and utensils, (e) sterile water rinsings of the vessel in which the utensils were washed, (f) washings of the cloth used for wiping the utensils after scalding, (g) rinsings of the milk pails immediately before milking (h) a pond in the field wherein the cattle grazed, (i) the herbage of the pasture, and (k) the straw in the cowshed.

Gelatine plates were exposed in the cowshed, and the colonies thus obtained subsequently inoculated into milk.

On submitting the samples to bacteriological analysis, the presence of an organism which produced ropy milk was found in the water obtained from the vessel in which the utensils were washed, from the cloth used for drying purposes, and from the pails, etc., which had been wiped with the cloth.

In connection with the washing of the utensils, a commercial compound of soda had been used, and if this was not thoroughly rinsed off the pails the organism became difficult to eradicate. Thus in common with Harrison's Variety No. 6, Group II, this organism thrived well in a slightly alkaline medium. This fact has an important practical bearing; for where commercial preparations are added to the water for the cleansing of dairy utensils, it is of the utmost importance that thorough rinsing should be given in clean water before the final scalding or steaming is done.

The primary cause of the trouble was, however, found to be the water in the field wherein the cattle grazed; in the hot summer weather they had waded in the pond and had arrived in the cowshed with mud heavily charged with the troublesome bacteria on their udders. During milking some of the dry mud had found its way into the pails. Once infection had thus begun, the continuous and ever present sources of trouble were the vessel used for washing purposes, and the cloth used for drying. Acting on advice, the farmer fenced round the pond and temporarily moved the cows to another pasture; he substituted another vessel for cleansing operations, thoroughly rinsed his pails in pure water after washing, scalded them with boiling water, and discontinued altogether the use of the cloth for drying. The trouble almost immediately ceased.

Preventive Suggestions

The account of this investigation, with others, was subsequently published in bulletin form by the Bacteriological department of the College (John Golding and Wilfrid Sadler).

Suggestions were made therein for the guidance of the farmer in preventing outbreaks of ropy milk, and in dealing with the trouble when such actually occurs; some of which suggestions are as follows:—

1. As water is a frequent source of the trouble, special care should be taken in washing the pails, etc., after each milking. When thoroughly clean these should be well scalded with boiling water or steam, and should not again be rinsed with cold water or wiped with a cloth.
2. Pails and other vessels intended for the reception of milk should then be inverted in a position free from dust.
3. Dilute solutions of washing soda favour the growth of the organism and precautions should be taken accordingly.
4. Straw litter and feed may be infested with the ropy-milk organism, and milkers should refrain from handling such immediately before milking.
5. No such material should be brought into the cowshed or fed to cattle just before or during milking.
6. The cows should be kept clean, and if they have had access to muddy ponds the udders should be washed.
7. Ponds and streams should be fenced off, in order to prevent the cows wading in them.
8. On the first indication of an outbreak of ropy milk the cattle should, if possible, at once be turned into another pasture.

In conclusion, I may add that a simple means of ascertaining whether or not individual cows are responsible for the infection of a milk supply with the ropy-milk organism is easily available on any farm or in any dairy.

Boil a number of small bottles — 8 oz. size or less will suffice — and when cool milk a little of the milk direct from each cow, having previously cleaned the udder. Plug the bottle with cotton wool and place at a temperature of about 60° - 70° F. Within twenty-four hours ropiness will frequently appear, if infection is present.

As the temperature noted above is that best suited for the growth of the common ropy-milk organisms, the importance of quick and effective cooling of milk, immediately after it is drawn from the udder, cannot be sufficiently emphasized.

WILFRID SADLER.

CONSTRUCTION OF SMALL CONCRETE ICE-HOUSES

Home supply of ice affords comfort and produces profit

DURING the sweltering heat of summer many a country family longs for the comforts afforded by a home supply of ice. Too often summer passes without any preparation having been made for harvesting the winter ice crop. Now is the time to get ready for next summer by building an ice-house. For a private supply many persons are using concrete ice-houses, since concrete is heat-resisting, is not rotted by the continual dampness from the ice and is ready every winter without repairs. Likewise a concrete building is fireproof, a quality especially valuable in the country.

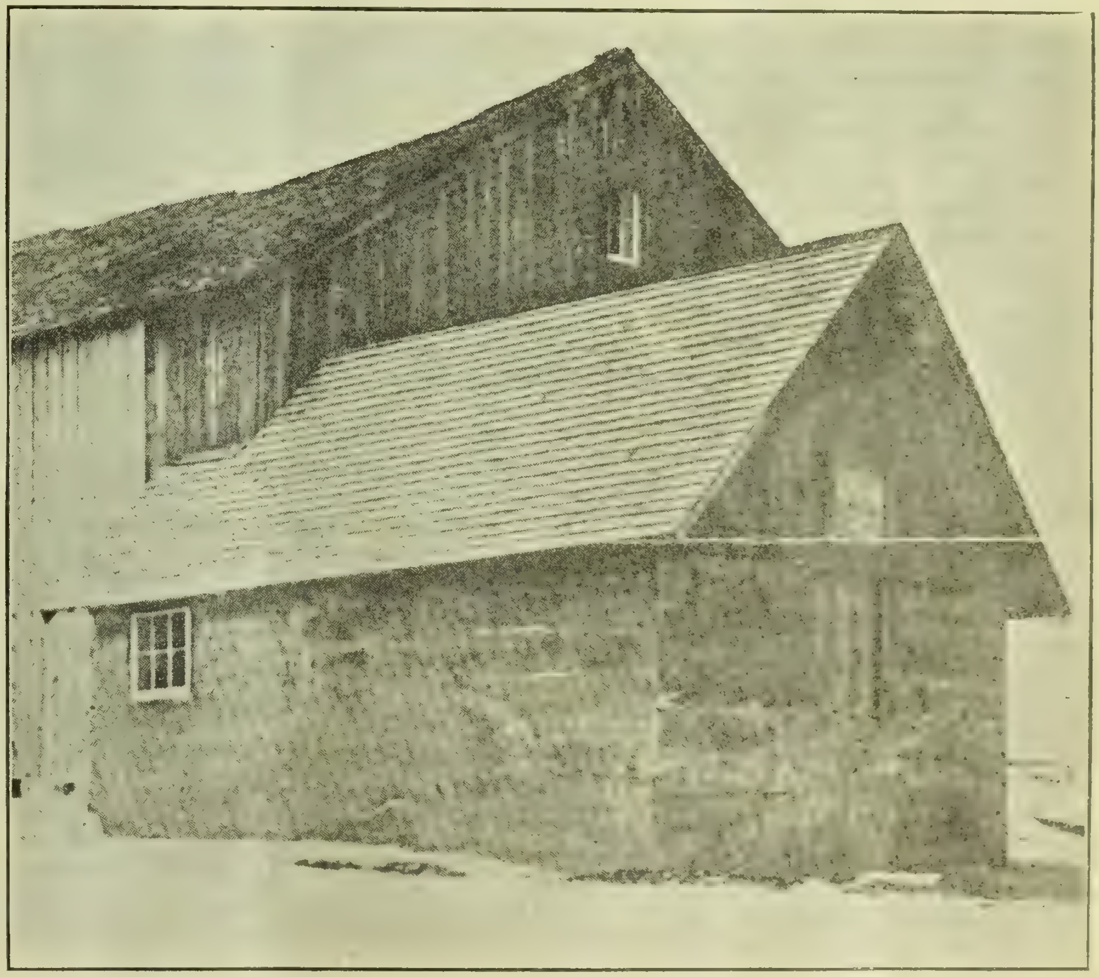
Size of Building and Location.

With a concrete house, successful storage of ice depends only upon *careful packing, air-trapped drainage* at the floor line, and *well regulated ventilation* beneath the roof. Therefore the ice-house must be located on a well drained site and, if possible, in the shade of other buildings or trees. It should be turned end to the south.

The size of the building is dependent on the needs of the family. Nearly any household will consume one hundred pounds every day, or ten tons for the season. One cubic foot of ice weighs 57 pounds and a ton in the ice-house occupies about 40 cubic feet. If the ice is of a poor quality, meltage frequently amounts to one-third the quantity harvested; therefore it is wise to build a house of a capacity twice the calculated needs. For a farm with a small dairy, a sufficient supply can be stored in a building 10 by 14 feet (inside measurements) by 9 feet to the eaves and 13 feet to the comb of the roof. With an allowance of 1 foot on all sides of the ice for a packing of sawdust, the capacity of this structure is 20 tons.

Method of Construction

Either concrete blocks or solid concrete may be used for the walls. Dig the foundation trenches 10 inches wide and 2½ feet deep. To remove water from the melting ice, lay a string of 4-inch drain tile from a point outside the building and ending at the service door, so that the top of the last pipe, a sewer "goose neck," will be at floor line 4 inches above natural ground level. Fill the foundation trenches with concrete proportioned 1 to 2½ to 5. Above ground level the walls may be made of blocks (laid in a 1 to 2 cement-sand mortar) or of solid concrete. For the solid wall mix the concrete 1 bag of Portland cement to 2

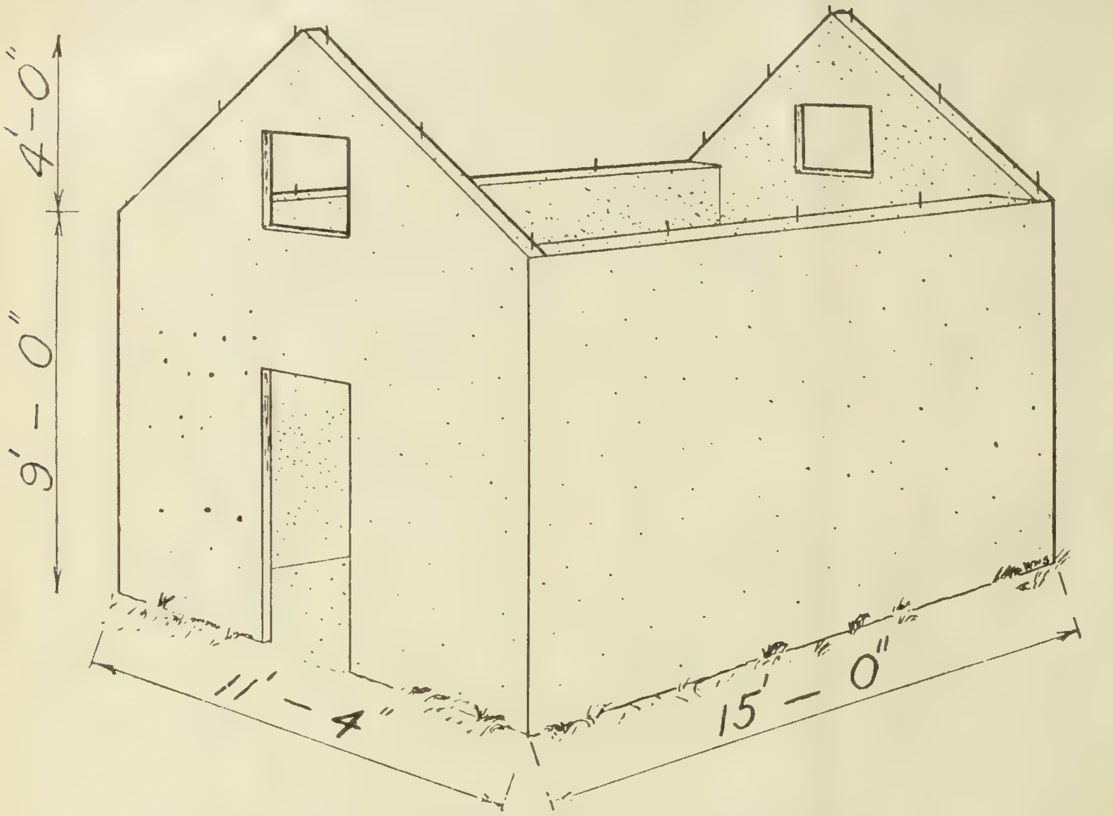

Concrete Ice-house: Milk Room in Rear

POULTRY

IMPROVING POULTRY EXHIBITS

THE Agricultural Exhibitions are now in progress and a large number will be held throughout the province this fall. At many of the shows I have noticed considerable neglect as far as the poultry exhibit is concerned. Quite a number of the large shows and the great majority of the small shows throughout the country give but very little consideration to the proper classification of birds in the show-room, and,moreover, sufficient prizes are not given to induce larger entries. Almost any of the smaller shows visited will be found with only a few birds in the poultry exhibit, the whole exhibit being most unattractive. The birds are usually shown in home-made coops which are of all sorts, shapes and sizes. Many of the coops are such that the birds can hardly be seen, and some coops are fixed so that the birds cannot possibly be taken out to be examined. The birds are not arranged according to breeds, classes, or in any other way. The judge may find Barred Plymouth Rocks scattered all through the exhibit. He may find one exhibit of Pekin ducks at one end and another exhibit of the same breed at the other end of the row of coops. These conditions certainly do not tend to improve the exhibit or to encourage exhibitors.

Moreover, at many of the exhibitions there are a large number of inferior birds entered. Some



Rot-proof Ice-house of Twenty Ton Capacity.

cubic feet of sand to 4 cubic feet of crushed rock, or 1 part cement to 4 parts bank-run gravel. Use movable forms, 3 feet high and extending around the entire building, to hold the mushy wet concrete until it sets. The day after they are filled, the forms may be loosened, moved up and filled again. During the placing of the concrete, reinforce the walls, 3 inches from the outside, with woven wire fencing or with ⅜-inch rods spaced 18 inches apart and running in both directions. Stagger the rods by placing half of them 3 inches from the inside surface of the walls. Imbed two rods or an old wagon tire in the concrete two inches above all door openings. During the construction set a service door frame (2½ by 6½ feet) between the forms at one end of the building. Likewise, while pouring the concrete for the gable ends, make provision for small ventilation doors 2½ feet square.

A wooden roof, while not durable like one of concrete, is more easily built. To hold the plates on the top of the side and gable walls, sink ½-inch bolts 8 inches long, heads down 6 inches into the concrete. Use 8-foot rafters and cover the building with a watertight roofing material.

Lay a 4-inch concrete floor upon the natural ground and give it a slope of ¼ inch to the foot in the direction of the drain at the service door. Place a trash strainer in the drain opening. The water in the "goose neck" sewer pipe will act as a seal and keep out the warm air of the drain.

Hinge the small doors in the gables to outside and top of the frames, so that they can remain slightly open at the bottom yet shut out rain. The service door also swings outward. The frame is fitted with short removable sections of boards set in slots or grooves so as to hold the packing in place.

Storing and Removing Ice.

In storing ice use a thickness of 12 inches of sawdust or 18 inches of marsh hay or straw over the floor and around the sides of the house. Set the ice on edge and pack it tightly together without any filler between the cakes. To prevent blocks from slipping, lay them in courses lengthwise in opposite directions in what masons call "headers and stretchers". When the house is full, cover the ice-pack with sawdust or hay weighted down. Keep the service door closed while removing ice and take care that the pack is again well covered. See that the drain works properly and prevents water from standing on the floor.

Materials and Cost.

For building this solid wall concrete ice-house, there will be required 27 barrels of Portland cement, 8½ cubic yards of sand, 17 cubic yards of crushed rock and 74 pieces (250 pounds) of ⅜-inch rods 9 feet long. If a good pit gravel is at hand, haul 18 cubic yards: no sand will be required other than that in the gravel. The approximate total cost of these materials is $75.00. Such a structure will not rot out and will keep the ice with minimum shrinkage. And by means of ice, not only can more comfort be secured in hot weather, but also fruit, poultry and dairy products can be marketed at a greater profit.

ECONOMICAL MILK PRODUCTION

THE manufacturer perhaps more than the retailer looks closely after the matter of cost knowing that his principal hope of making a good profit lies in attaining economy in the actual production of the article, for no profit can be expected if the selling price is below the cost price.

Is not the dairy farmer a manufacturer? So it would seem to be wisdom to look the more closely after cost, especially as he does not expect the selling price of milk to soar. Assuming that the farm is in good condition and carefully handled, what does milk cost per hundred pounds? That can be ascertained only by keeping records of each individual cow.

This is all the more necessary because "men (and cows) were deceivers ever". They may appear to be good heavy producers, but their value as economical producers can only be determined when their yield of milk and fat is checked up by the scales and test. Of what use is it when the factory pays 95 cents per 100 pounds to keep cows whose milk costs $1.25 per 100 pounds just for feed alone? This is what often happens till cow testing is taken up. Milk and feed record forms are supplied free on application to the dairy division, Ottawa.

It is quite possible to have one dollar's worth of feed return two dollars' worth of milk through good cows, that is cows selected by the test. This is both economical and profitable milk production. The average cow is not an economical producer because she has not been selected, but, like Topsy, "just growed". A dairy farmer will prove his business ability as a manufacturer when the herd is composed of economical producers. Make each cow pay a good profit.

C. F. W.

MEN WELL SATISFIED

SPEAKING of his experience with cow testing for three years one farmer near St. Hyacinthe, Quebec, recently expressed himself as very well satisfied. He had good reason to be, for in June this year his 9 cows averaged 1,203 pounds of milk each, a total of 10,830 pounds. Three years ago the average was only 823 pounds, the total only 7,411 pounds.

In other words, his income from the nine cows was thirty-four dollars greater in one month this year.

Instances very similar to this may be found in every county where cow testing has been taken up intelligently. Near Listowel, Ontario, is a herd of 16 cows that give on the average 2,700 pounds of milk more per cow than three years ago. The addition of four hundred and thirty-two dollars per year to one's income, without increasing the number of cows, is a substantial and tangible result of intelligent weighing and sampling.

Again, at Wooler, Ontario, is a herd now giving 8,307 pounds of milk per cow, an increase of almost 3,000 pounds per cow.

Record forms for milk and feed, and a herd record book, will be supplied free on application to the dairy commissioner, Ottawa.

C. F. WHITLEY,
Dairy Div., Ottawa.

Mr. E. Chaddock of Cookshire and his Plymouth Rock pullets

mongrel birds are often entered to which it would be very difficult to ascribe any particular breed. I have often seen single-comb white birds entered as White Wyandottes and rose-comb white birds entered as White Plymouth Rocks or White Leghorns. There seems to be a practice among a certain class of people of buying up a large number of birds representing various breeds for the sole purpose of entering them in the show. This is a very bad practice and the directors of the exhibition should aim to discourage this as much as possible. More consideration should be given to the farmers who are breeding good poultry, and I would strongly suggest that many of the non-commercial breeds be struck from the entry lists. The agricultural show is expected to serve the interest of the community in fostering the development and improvement of agriculture, including the poultry industry.

As far as poultry exhibits are concerned the directors of the show should simplify the entry list, giving good prizes for a few of the commercial breeds. I would also suggest that a graded prize list be provided whereby the largest entries would command the largest prizes. For instance, it is very probable that a bird winning first prize in an entry list of 50 will be far superior to another bird winning first prize in an entry of two or three. It follows that the stronger the competition the better will be the exhibit. Consequently, the graded prize list would be justifiable. I would suggest that the prize list be restricted to about the following breeds:—

Plymouth Rocks,	Barred,
" "	Any other variety.
Wyandottes,	White
"	Any other variety.
Rhode Island Reds,	Single or Rose-Comb,
Orpingtons,	Any variety,
Leghorns,	Single-Comb White,
"	Any other variety,
Ducks,	Pekin,
"	Indian Runner,
"	Any other variety,
Geese,	Toulouse or Embden,
"	African,
"	Any other variety,
Turkeys,	Bronze,
"	Any other variety,

The above classification will allow practically all farmers to exhibit their popular commercial breeds. The elimination of undesirable classes will save the Exhibition Association considerable money. Also the adoption of these suggestions will tend to improve the poultry exhibits which, in many cases, are not short of a disgrace to the exhibition.

M. A. JULL

CO-OPERATIVE EGG CIRCLES

"THE Organization of Co-operative Egg Circles" is the title of pamphlet No. 4 by W. A. Brown, B.S.A., of the Poultry Division of the Live Stock Branch, Dominion Department of Agriculture. In introducing this subject the writer defines a co-operative egg circle, states the need of organization and the work that can be accomplished.

The benefits, methods, and details of organization are exhaustively dealt with and directions for setting up and using an egg-testing appliance are given.

The pamphlet, copies of wich may be obtained upon application from the Publications Branch, Department of Agriculture, Ottawa, concludes with a proposed constitution and by-laws suitable for an Egg Circle.

INTERESTING CONVENTION OF POULTRYMEN

THE Seventh Annual Meeting of the American Association of Instructors and Investigators in Poultry Husbandry was held at Macdonald College, August 5-7. The meeting was attended by poultrymen from various parts of United States and Canada, delegates coming from as far west as Minnesota and Alberta, and from as far east as Maine and Nova Scotia.

Dr. F. C. Harrison, Principal of Macdonald College, delivered the address of welcome. This was responded to by Professor James E. Rice, Cornell University, Ithaca, N. Y. Professor Rice is one of the originating principals of the Association, and his remarks dealt with the importance of poultry husbandry as an agricultural industry. He referred tp the position which the College Poultry Department holds, and assured the College they were glad of the opportunity of holding their annual meeting in Canada.

The purpose of the annual meetings of this Association is to stimulate efforts for improvement of the standards relative to the development of the whole poultry industry. It is a meeting place for all those who are engaged in educational and research work, and provides an ample opportunity for organizing all lines of work. Practical and scientific papers are presented for discussion. The scientific papers are invariably of economic value. Besides the mere gathering together of men from different parts of the country engaged in the same line of work, these meetings tend to standardize all educational work and a healthy spirit of co-operation is also developed.

The first paper to be presented was one by Professor W. R. Graham of the Ontario Agricultural College, on "The Inheritance of Barred Plymouth Rock Color and Other Characteristics as seen in crossing Black Hamburgs and Barred Plymouth Rocks". Professor Graham has been carrying on this crossing work for a number of years and has established well-defined lines regarding the inheritance of certain characteristics. The Barred Plymouth Rock is a good utility fowl, being a good winter layer and also an excellent table bird. Black Hamburgs were used because it was possible in this breed to obtain a standard exhibition fowl, at the same time possessing good egg-laying qualities. It is very doubtful if this can be said of every breed.

The next paper was on "The Inheritance in Cross-Breeding" by Professor H. R. Lewis of the New Jersey Agricultural Experiment Station. The results of this work were based on crossings made between Barred Plymouth Rocks and White Leghorns. Some interesting facts were established regarding the inheritance of Barred Plymouth Rock barring in different matings.

A paper which was appreciated about as well as any other paper presented at the meeting was the one given by Dr. T. P. Shaw, of McGill University, Montreal, on "Recent Findings Concerning the Physiology of Digestion in the Domestic Fowl". Dr. Shaw presented his matter in a very brief and clear form. The process of digestion and assimilation was first outlined. In experimental work Dr. Shaw has found that the digestive functions of the stomach of the chick are developed by the second day after hatching. The pancreatic ferments, on the other hand, were imperfectly developed before the seventh day. The assimilation of protein was dealt with at length since protein is the most important food constituent. It was demonstrated how the various groups of protein are broken down into smaller groups and are acted upon by the ferments of the digestive tract. It has been established that sweet milk is of comparatively little value for poultry feeding. Milk is not a natural food for fowls, and consequently the fowl relies upon bacterial action for the assimilation of the constituents of sour milk. All milk should be fed in a sour condition and it is of greatest value when just thick sour. Some rather interesting work has been done with the gizzard. Some writers claim that grit is not necessary for poultry, but so far no experiments have been carried out where fowls fed on grain and with no grit did as well as fowls with free access to grit. Dr. Shaw found between 15 and 25 particles of grit varying in size from that of a pin head to that of a split-pea after birds had been without grit for three months. Doubtless the presence of grit in the gizzard assists in the crushing of particles of grain. Also it prevents impaction of the crop and tends to keep the grain particles separate in the gizzard, so that the digestive juices can act upon them readily.

The only paper on "Incubation" was presented by Professor Horace Atwood of West Virginia University. Prof. Atwood submitted a paper on "The Role of Carbon-Dioxide in Incubation", and so far has established the amount of carbon dioxide given off by eggs during the incubation period.

Professor James E. Rice of Cornell University presented a paper on "The Distribution of Egg Production". The Poultry Department at Cornell, under the supervision of Professor Rice, has been studying egg-laying characteristics for several years and has obtained some very valuable results. They have found that there are a number of hens which laid more eggs in their third and fourth years than they did in their first and second years. In their breeding work they have found that the heaviest-laying hen does not always produce the heaviest-laying daughter, and it has become a question with them as to the length of time that should be considered in determining the egg-laying and breeding ability of a hen. The results of the work up to the present seem to indicate that in the future birds will probably be kept for a longer time than at present. Doubtless also we shall endeavor to improve the egg-laying ability of a hen for two and three years and not for one only as we are doing at present.

"The Value of Sour Milk for Feeding Little Chicks" was discussed by Mr. Roy E. Jones, Assistant in the Poultry Department of Connecticut Agricultural College. The results of a large number of experiments were given by Mr. Jones and it was pointed out that sour skim milk is worth almost any price for feeding young chicks. When fed along with grain it makes the chickens grow faster and it also keeps them in a healthier state. It should be fed when thick sour and they have found that really the best time to feed it is just

WOMAN'S WORLD

THE HOMEMAKERS' CLUBS IN PONTIAC

In Pontiac we have six branches of the Homemakers' Club which, though still in their infancy, are doing excellent work. This is not by any means as many of these organizations as we should have in our large county. I think, the reason why this work has not been taken up to a greater extent is because the women do not fully understand the object of these Clubs or the benefits to be derived from them.

Now, the object of these Clubs is to bring together women to discuss the problems of housework in all its different branches. In every other business we find organized meetings to discuss the business and thus by co-operation, improve, lighten and make more profitable the work. Then why should the housewife continue along in the same old rut? Let her get out among her neighbors to discuss her business, for after all is hers not the most important work of the world to-day? On her depends the home-making for the bread-earning partner and the moulding of the young lives of our future men and women. As it

---

when it starts to get thick.

The next paper of particular interest was by Mr. C. Thompson, Assistant in the New Jersey Agricultural College, who discussed "The Controlling Factors in the Feeding of Chicks". The Experiment Station of New Jersey has carried on an extensive experiment on "The Ash and Protein Factor in Poultry Feeding". White Leghorn and Barred Plymouth Rock chicks were used and were fed on various rations, the idea being to determine the comparative value in regard to broiler and egg production. The most important result which has been obtained so far is that protein from an animal source, such as beef scrap, fish scrap or sour milk, is much more valuable than protein from a vegetable source, such as gluten meal or linseed meal. The addition of animal protein in the form of meat scrap materially increase the efficiency of the ration relatively high in vegetable protein, both for egg production and for flesh growth. Phosphoric acid from an organic source is much more efficient than phosphoric acid from an inorganic source. They also found that laying hens fed on rations deficient in protein not only give a low production but the eggs which are produced are undersized.

For a number of years this country has suffered terribly from the ravages of white diarrhoea. This disease was very prevalent throughout Eastern Canada and the Eastern States some six or seven years ago, and at that time it attracted a great deal of attention. Subsequently a number of Experiment Stations and Colleges became directly interested in combating the disease. One of the Stations to take up this work was the Massachusetts Agricultural College, and at this Convention Dr. Gage of that institution, presented a report of the work which he had been carrying on for a number of years. It was found possible to detect the presence of White diarrhea germs, called *Bacterium pullorum*, by testing eggs laid by the hen. This method, however, of detecting the presence of the disease, is not entirely satisfactory, but the macroscopic agglutination test has proven a good laboratory method for the detection of adult hens harboring or which have harbored *Bacterium pullorum*. This work is of practical value, since the Massachusetts College is endeavoring to combat the disease in that state. They have a man on the road collecting blood samples from hens among the farmers' flocks. These samples of blood are forwarded to the College at Storrs, Conn., and a report is sent to the farmer. If his flock is affected with white diarrhoea steps are taken to eradicate the disease.

Another disease which is of very great importance to the poultry industry is "Roup" which was discussed by Professor A. G. Phillips of Purdue University, Lafayette, Ind. Dr. F. C. Harrison of Macdonald College upon request gave an interesting talk on the disease.

Dr. H. G. Goodale, of the Massachusetts Agricultural College, presented a paper on "The Rhythm of Egg Production" and showed that under average conditions hens are inclined to lay in cycles.

Two very valuable scientific papers were presented by Dr. Raymond Pearl of the Maine Agricultural Experiment Station. Dr. Pearl has established "A New Method of Measuring the Rate of Fecundity in the Individual Fowl". The subject matter presented is somewhat technical in nature and the determination is based upon mathematical proportions. Nevertheless the result is of very great importance in poultry-breeding work. Dr. Pearl also presented a paper on "The Effect of Mammalian Corpus Luteum Extract on Ovulation in the Domestic Fowl". In brief, the results were that egg production was suppressed.

The President of the Association, Professor J. C. Graham, Massachusetts Agricultural College, presented an excellent paper on "The Management of a College Poultry Plant". The matter was discussed from an educational and a commercial standpoint. Many valuable suggestions were given in regard to controlling the work of a College plant, and suggestions were made for improvement.

A paper which caused a great deal of discussion was that presented by Professor W. R. Graham, of the Ontario Agricultural College, on "A Score Card for Market Poultry and Eggs". This is a very live topic in the poultry business, and is especially important since no standard method of scoring live or dressed poultry and eggs has yet been established. The score card presented by Professor Graham, which is also to be presented to the American Poultry Association in Chicago, was a carefully-prepared and well-balanced score. It led to a great deal of discussion and suggestions were made for a revised score, but the question proved so difficult that the score was left practically as submitted. Owing to the fact that this matter is being presented to the public through the American Poultry Association, it is impossible for us to submit the score card here.

The latter part of the program was taken up with a discussion of extension work. This was chiefly confined to poultry work in the rural schools. Professor N. E. Chapman of the University of Minnesota outlined the work which they were doing in Minnesota where they have students of several hundred schools throughout the State engaged in poultry work. The extension work in Minnesota is well organized and over a thousand children are actively engaged in some phase of poultry raising. This is a line of work which will count for far more good than the average poultryman realizes. It is a permanent work, the results of which will be best realized in 10 or 12 years.

Professor M. C. Herner, of the Manitoba Agricultural College, also discussed extension work among rural school children. Professor Herner has organized a number of Boys' and Girls' Poultry Clubs which have been working quite satisfactorily.

The Officers elected for the ensuing year are as follows:—

President, Prof. W. F. Kirkpatrick, College of Agriculture, Storrs, Conn.

1st. Vice-President, Mr. M. A. Jull, Macdonald College, Que.

2nd. Vice-President, Dr. H. G. Goodale, Massachusetts Agric. College, Amherst, Mass.

Sec-Treas. Prof. H. R. Lewis, New Jersey Agricultural College, New Brunswick, N. J.

Directors, 1913-15 Dr. Raymond Pearl, Maine Exp. Station, Orono, Me. and Prof. W. R. Graham, Ontario Agri. College, Guelph, Ont.

Directors, 1914-16 Prof. Jas. E. Rice, Cornell College of Agriculture, Ithaca, N. Y., Mr. F. C. Elford, Central Experimental Farm, Ottawa, Ont., and Prof. J. C. Graham, Massachusetts Agric. College, Amherst, Mass.

THE CANDLING OF EGGS

The Quality of Eggs may be readily Determined without Breaking the Shell.—Consumers should learn the Art of Candling. —The Government is distributing Candling Appliances Free.

Few consumers appreciate the fact that the quality of an egg can be accurately determined without breaking the shell. The process of candling eggs is not difficult and with the view of encouraging consumers generally in the art and practice of candling, the Poultry Division of the Live Stock Branch of the Dominion Department of Agriculture is distributing gratuitously throughout the country in the same manner as Bulletins are distributed, sinple convenient cardboard egg candling appliances. These may be obtained upon request to the Live Stock Commissioner, Ottawa.

It is not generally known that an egg appears semi-transparent when held before the light in a darkened room and that, if carefully rotated, even minor defects may be seen. Pamphlets dealing with this matter have been prepared, and illustrations included showing in detail the characteristic appearance of both good and bad eggs when being candled.

The contents of an egg, when laid, completely fill the shell, but as cooling takes place contraction occurs and an air space is formed in the large end. The yolk is only slightly perceptible and readily turns round in the albumen when the egg is rotated.

A stale or shrunken egg may be detected by the size of the air cell. A bad egg is easily recognized through the contents having become dark and opaque. The size of the air cell, the consistency of the albumen, the colour and mobility of the yolk and the general transparency of the whole egg are the factors most generally recognized as determining quality.

The candling of eggs is not a difficult process. It requires but little skill to tell at a glance the difference between good and bad eggs and anyone with practice can learn to differentiate between the various grades of good eggs.

The appliances mentioned above are of two different types, one suitable for use with the kerosene lamp and one suitable for use with the electric light. Neither the small amount of trouble required to secure one of these appliances nor the amount of labor entailed in candling presents any valid reason why the public should be obliged to use or accept bad or incubated eggs. Storekeepers will find it to their advantage to acquire facility in candling and it is recommended that every housewife should provide herself with one of these simple candling appliances, by the diligent use of which she may safeguard her family from many unpleasant occurrences at the breakfast table.

is she goes on from day to day with the same routine and then complains and the worst of it all is there is no end to her work. Let her stop to consider if hers is the best and easiest method and nine times out of ten she will say "No".

Then, too, we find the woman who says she has not time to attend these meetings. Now, these are the very women we are after, for the woman who cannot get one afternoon a month off certainly needs a new method of doing her work. Then is something sadly wrong with her present method.

Look at these Clubs, too, from an economical standpoint and surely they are beneficial. If your neighbor can do her work equally as well as you do in half the time by all means adopt her system. At one of our meetings held recently the weekly laundry was discussed. I found that nearly every member soaked her clothes. I tried this plan and found I could save almost three hours time at my laundry. I am not only economizing in time but in labor also for the soap is doing the work I was doing. By discussing these matters with our neighbors we are making more efficient workers and leaving more time for social enjoyment and self-improvement.

Miss Campbell of Macdonald College will be pleased to visit any community to assist in organizing these clubs and will further help on the good work by furnishing literature on almost any subject the Club wishes to take up. Let us hear of more clubs being organized in Pontiac and surrounding counties.

A. M. H.

FOODS AND FOOD PREPARATION

Lesson VIII

JELLY-MAKING

SEPTEMBER is the month for jelly-making. Many inquiries regarding this art have already reached us and we feel that our lesson is in season.

The Ideal Fruit Jelly

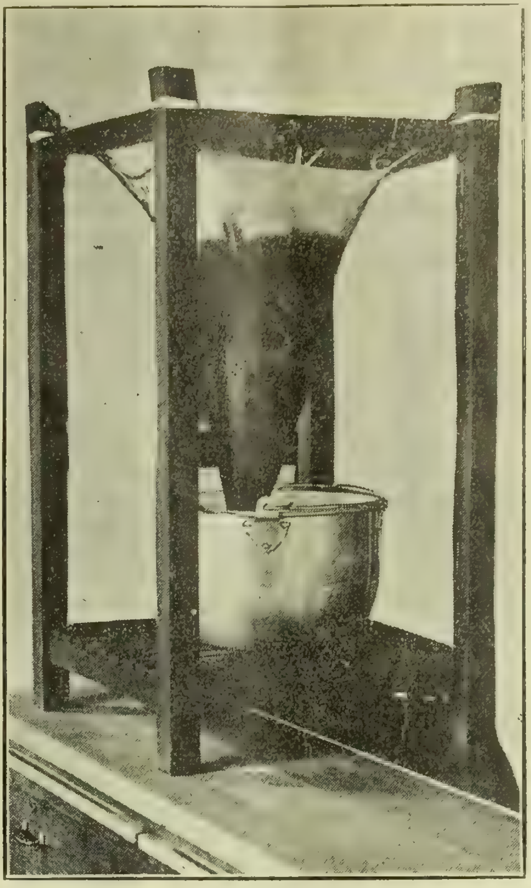
How proud is the housekeeper who can point to a row of glasses containing jelly, clear, quivering, beautifully colored, with a texture so tender that it cuts easily with a spoon and yet sufficiently firm that the angles retain their shape; a delicacy that is neither gummy, syrupy nor tough, and not brittle yet that will break with a distinct, beautiful cleavage that leaves sparkling characteristic faces!

This is the ideal fruit jelly. How many housekeepers can claim that their jelly possesses all these points? Very often we find otherwise excellent housekeepers fairly well satisfied, providing their jelly will "jell", although it may be tough or dark in color.

Experts have been at work on this subject and have found out for us the "why" of jelly-making and how to suit methods and proportions to the varying conditions which arise. If due attention is paid to their advice and the work undertaken intelligently there need be no indifferent jellies at the homes of the club workers this year.

Why Jelly does or does not Jell

Fruit juice consists largely of water in which are dissolved small amounts of flavoring matter sugar, vegetable acids and a substance called *pectin.* The acids are necessary in the process of jelly-making, but it is the *pectin* which makes the jelly "jell". Fruit juices which are rich in both pectin and acid are the best for jelly-making. Pectin is plentiful in the juices of currants, grapes, blueberries and sour apples. Many fruit juices which are fairly rich in pectin are deficient in acid, i. e. : Strawberries, raspberries, peaches and pears. Very good jelly may be made from these by adding just enough of some vegetable acid (tartaric or citric) to give the juice about the same tartness as sour apples. Juice of sour apples may be added to a juice weak in acid instead of the acid powder.



A simple home-made device that makes jelly-making easy.

Test for Pectin

Mix one tablespoon of juice with one tablespoon of grain (or ethyl) alcohol. If pectin is present a jelly-like substance will appear which can be gathered up with a spoon. The amount of this that forms indicates the strength of the juice in pectin. Very often this pectin is not found in the juices of raw fruits, or if found is in very small quantities, yet the juices obtained from cooking these fruits may be rich in this material.

Extracting the Juice

1. Juicy fruits (currants, grapes, etc.). Place the clean fruit in an enamelled preserving kettle. Add just enough water to prevent burning —about 1 cup to 4 or 5 quarts of fruit. Cover and simmer, stirring occasionally with a wooden spoon. Crush the fruit well with a masher and simmer until the whole mass is thoroughly cooked. Pour into a jelly bag, wrung out of hot water, and allow to drain into an enamel or earthenware dish. This juice is "Extraction No I". When extraction No I is fairly drained out, do not squeeze out the pulp which remains or the second lot of jelly will be cloudy. Instead of this return the pulp to the preserving kettle, cover with water, stir until thoroughly mixed, bring slowly to the boil and drain as before. Test with alcohol and if much pectin has been obtained a third extraction may be made in the same way. Handle Extraction I by itself but time is saved by mixing Extractions I and II.

The best way to treat Extractions I and II is to boil them down rapidly until they are about as strong as extraction I. You can judge this by the pectin test and by the taste. Then, follow the general rules which are given for extraction I.

Making up Extraction No. I

(1) Proportion of sugar.

Remember that success or failure depends almost entirely on the proportion of sugar used. Too little sugar means a tough jelly, and an over proportion will prevent the juice from jellying. Experiments have also shown that too much sugar will cause a crystallization of sugar from the jelly. The amount of sugar used will depend upon the amount of pectin in the juice as the pectin is capable of using only a certain amount of sugar.

We cannot follow recipes as the same fruit varies each year in its amount of this material. The only safe way is to use the alcohol test given. If a firm jelly forms use equal measures of sugar and juice; if a loose jelly, 3-4 sugar to 1 juice; if a very loose jelly, 1-2 sugar to 1 juice.

When to Add the Sugar

The sugar may be added to the fruit juice at the beginning, in the middle, or near the end of the boiling. If the sugar is added at the beginning the jelly will be darker in color. Probably the best time to add it is about half way between the beginning and the end of the boiling. In any case the sugar should be heated: so as not to cool the juice and delay the time of boiling. No simmering for a long time should be allowed, for a long action of the acid in the juice destroys the power of the pectin.

The Jelly Test

The time of boiling varies usually from 12 to 25 minutes. There is no time for cooling samples, as changes may be going on in the kettle. The best test is what is known as the spoon test. The liquid "Sheets off", or breaks off, as a portion of it is allowed to drop from the stirring spoon. At this point the jelly must be removed *at once* and poured into glasses.

The following rules based on the above may be satisfactorily followed.

(1) Extract juice of juicy fruits according to above rules.

(2) With less juicy fruits, as apple, quince, etc., discard any unsound parts, cut in small pieces, (skins and seeds included) cover with water and proceed as in juicy fruits.

(3) Measure out the sugar in correct proportion to the juice, from 1-2, 3-4 or 1 part of sugar to 1 part fruit juice depending on the amount of pectin. (See test).

(4) Heat sugar.

(5) Boil fruit juice about 10 minutes (the more pectin there is, the less time it is boiled).

(6) Add heated sugar and stir until well dissolved.

(7) Boil until the jelly responds to the spoon test.

(8) Pour *at once* into hot sterilized glasses.

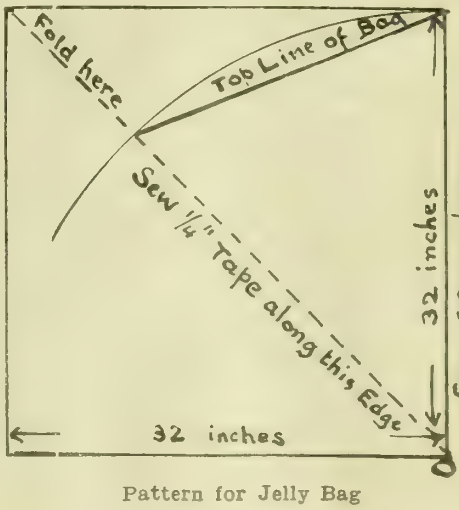
(9) Let stand uncovered in a cool place until it sets.

(10) Cover with hot melted paraffin and screw on the top.

NOTES

The Jelly Bag

Properly made jelly bags are a joy to the housekeeper. The kind that sags or "points off" in any direction except into the receptacle beneath is a great annoyance. Use linen 32 inches wide. Fold the goods so as to make a true bias (having the warp threads at right angles to the woof).



Pattern for Jelly Bag

Taking the point marked "O" in the diagram as the centre and the line marked 32" as radius describe a circle. Where the circumference cuts the sides of the triangle draw a straight line between those points as indicated, and cut. Stitch a tape to the folded side to prevent sagging. Seam up the other and face the top with a straight piece of the goods. Sew on tapes as in illustration.

Paraffin

Do not throw away the paraffin when the jars are opened. Wash the "cake", dry it and put it into a container *kept for this purpose.* If this is done tidiness and economy are combined and the paraffin will be ready for next year's jelly-making.

F. CAMPBELL.

THE CHILDREN'S HOMER

VII

WHEN fighting began again after the truce, Hector and his men were victorious all day. Zeus himself watched over Hector and forbade any of the other immortals to interfere. Even Diomede, warned by thunder from Olympus, fled from Hector. The Greeks were driven to the very walls around their camp, and, as night came on, the Trojans encamped there, and built huge watch-fires, lest the Greeks should attempt to flee in their ships under cover of the darkness.

The Greeks held counsel, and King Agamemnon wished to give up and go home, but Diomede said,

> "If thy mind move thee to be gone, the way is open, go;
> Mycenaean ships enough ride near, that brought thee to this woe.
> The rest of Greece will stay, nor stir till Troy be overcome".

Nestor, also, declared that they must stay and fight it out, and bade Agamemnon send ambassadors to Achilles, offering him gifts to induce him to fight again for Greece.

Reluctantly, Agamemnon agreed, and promised "seven sacred tripods, twenty bright caldrons, twelve young horse, well-shaped and well controlled. Then he shall have back fair Briseis, and when Troy is taken, with brass and gold he shall load his ships, and other, greater gifts we will bestow".

Heralds, with three kings, took this message to Achilles. They found him playing on his harp, singing of the deeds of great heroes, while his friend Patroklos listened. He received the messengers courteously, gave them wine and food, and listened gravely while they told their errand.

But he replied that Agamemnon had done him too great wrong, and only tried to appease him now, not because he admitted his fault, but because he could not get on without him. Achilles said the Greeks had not hesitated to let him be deprived of his rights,—now he did not care what became of them. For his part, he was going home, and would let them settle their quarrels as they could.

The messengers were greatly downcast to hear this, and went back sadly to Agamemnon with their report.

Diomede said he was sorry they had fed Achilles's pride for nothing and now they must learn to win without his aid.

Agamemnon could not sleep that night, and called a council of the kings alone. There it was determined to send Odysseus and Diomede on a scout, to see if they could find out some of the plans of the Trojans.

Meantime the Trojans, too, had persuaded one of their men, by the promise of a great reward, to try to find out what the Greeks were about. This spy was Dolon, and it so happened that as Odysseus and Diomede went cautiously toward the Trojan camp, they saw Dolon, and chased and caught him. Dolon was much terrified when he found himself in the hands of two such mighty men, and answered all their questions, hoping they would let him go. But they killed him just the same, and went on their way with the knowledge they had gained from him.

He had told them that Rhesos, a king who had come to fight for Troy, was camped apart from the rest of the Trojan host, and he alone had set no guards. Rhesos had some wonderful Thracian horses, and Odysseus and Diomede at once made up their minds to get them, and not risk going where the camp was guarded. So they stole quietly to Rhesos's camp, slew the soldiers sleeping in front of his tent, killed him, stole the horses, and returned to the Greek camp in triumph, without being discovered at all.

Next day the fight began again and Agamemnon was wounded. Hector still conquered and now was so near the tents that Achilles became interested in spite of himself and sent Patroklos to inquire of the wounded how the battle went. Nestor, when he told him how the Trojans were gaining, besought him to come and fight, wearing Achilles's armor, which Patroklos promised to do, if Achilles would lend it.

Meanwhile the fight around the walls of the Greek camp raged fiercely,—the Greeks barely holding back the Trojans. Then Sarpedon, a great Lycian king spoke to Glaukos, the grandson, you remember, of Bellerophon, saying,

> "Glaukos, say, why are we honoured more
>
> Than other men of Lycia, in place; with great store
> Of meats and cups; with goodlier roofs; delightsome gardens; walks;
>
> More lands and better; so much wealth that court and country talks
>
> Of us and our possessions, and every way we go,
> Gaze on us as if we were their gods? This where we dwell is so;
>
> The shores of Xanthos ring of this; and shall we not exceed
>
> As much in merit as in noise? Come, let us be grest in deed,
>
> As well as look; shine not in gold, but in the flames of fight,
>
> That so our neat-arm'd Lycians may say: 'See, these are right
>
> Our kings, our rulers; these deserve to eat and drink the best;
>
> These govern not ingloriously; these thus exceed the rest,
>
> Do more than they command to do."

Glaukos made no reply except to follow where Sarpedon led, and after them went a throng of Lycians. So fiercely they charged the wall that Sarpedon gained a foothold on it, although the Greeks wounded Glaukos, and the other Lycians nearly fell back. But when Sarpedon called to them, saying,

> "Lend your hands! What many can dispatch,
> One can not think. The noble work of many has no match,"

—They joined him on the wall. There the fight swayed back and forth; the Greeks could not drive back Sarpedon, yet they would not let him over the wall, until at last, Hector, with his wonderful strength, tore away a huge stone, so heavy that two men of these days could scarcely lift it, hurled it at the strong-beamed gates, broke them open and rushed in , " as fierce and grim as any stormy night". After him came his men, and the Greeks turned and fled.

MARGARET GRAY

SCALE OF POINTS IN A FARM HOME CONTEST

MRS. Kedzie-Jones gives the following schedule of points for awarding a prize in a farm home competition:

Beauty	10
Wise money expenditures	15
Sanitation	20
Labor saving machines and conveniences	25
Food	30
Total	100

Concerning beauty she said that simplicity was the first requisite, and in bringing home this point she told the story of a Kentucky boy who lived back in the hills where large flowered and gaudy wall papers were considered essential in the parlor decorative scheme. One day he came into a home that was papered in the more neutral gray tints that rest the eye and give one a sense of comfort and ease. His admiration of the home was noted and on being asked his opinion, he said: "I reckon there won't be no quarreling here." Was not that about the neatest praise ever given to a home, and of how many homes could it be said?

Mrs. Jones says that more than all is the kind of life lived in the home. We want the best of all the things enumerated above, but "life is more than meat". We need to live comfortably and well, but the home has its moral obligations as well. She would emphasize a healthy body governed by a disciplined, intelligent morality.

Hoard's Dairyman

NEW BOOK

THE Source, Chemistry and Use of Food Products, by E. H. S. Bailey, Professor of Chemistry in the University of Kansas (Philadelphia: P. Blakiston's Son and Company, $1.60) .

Many of the articles which go to make up the diet of modern civilized man come from distant parts of the world. Examples of those foreign to us are tapioca, sago, raisins, bananas, nuts and spices, tea, coffee and cocoa. Many other articles of diet are so altered in the course of manufacture that we scarcely recognize them as products of the things we grow on our own farms. Of this class are the prepared breakfast foods, the starches and alcoholic liquors. Curiosity about the manner of growth of the imported foods and drinks and about the processes of manufacture of both the imported and home-grown articles is not only natural but laudable. It is likewise important to the modern housekeeper to know how foods compare in composition and nutritive value. Much reliable information on these subjects has been published in recent years in the scientific periodicals, in governement periodicals and in large technical treatises prepared for the guidance of food experts. In the volume before us Prof. Bailey has condensed the gist of this information into the space of five hundred pages. The book forms a convenient and reliable source of information upon the subject to which it refers. Our homemakers' clubs will find it useful.

OF GENERAL INTEREST

WAR

I abhor,
And yet how sweet
The sound along the marching street
Of drum and fife, and I forget
Broken old mothers, and the whole
Dark butchery without a soul.

Without a soul — save this bright drink
Of heady music, sweet as hell;
And even my peace-abiding feet
Go marching with the marching feet.
For yonder, yonder, goes the fife,
And what care I for for human life!
The tears fill my astonished eyes
And my full heart is like to break;
And yet 'tis all embannered lies—
A dream those drummers make.

Oh, it is wickedness to clothe
Yon hideous grinning thing that stalks
Hidden in music, like a queen
That in a garden of glory walks,
Till good men love the thing they loathe!

Art, thou hast many infamies,
But not an infamy like this.
Oh, snap the fife and still the drum,
And show the monster as she is!

RICHARD LE GALLIENNE.

HYMN BEFORE ACTION

The earth is full of anger,
The seas are dark with wrath.
The Nations in their harness
Go up against our path;
Ere yet we loose the legions—
Ere yet we draw the blade,
Jehovah of the Thunders,
Lord God of Battles, aid!

High lust and forward bearing,
Proud heart, rebellious brow—
Deaf ear and soul uncaring,
We seek Thy mercy now!
The sinner that forswore Thee,
The fool that passed Thee by.
Our times are known before Thee—
God grant us strength to die!

From panic, pride and terror
Revenge that knows no rein,
Light haste and lawless error,
Protect us yet again.
Cloak Thou our undeserving,
Make firm the shuddering breath;
In silence and unswerving
To taste Thy lesser death!

E'en now their vanguard gathers,
E'en now we face the fray—
As Thou didst help our fathers,
Help Thou our host to-day!
Fulfilled of signs and wonders,
In life, in death made clear—
Jehovah of the Thunders,
Lord God of Battle, hear!

RUDYARD KIPLING.

QUEBEC FAIRS, 1911

List of Exhibitions to be held in the Province of Quebec by the Agricultural Societies during the year 1914.

Society.	*Place.*	*Date.*	*Secretary.*	*Address.*
Argenteuil,	Lachute,	Sept. 22, 23, 24,	G. J. Walker,	Lachute.
Arthabaska,	Victoriaville,		Hon. Ls. Lavergne,	Arthabaska.
Bagot,	St. Liboire,		L. A. Brunelle,	St. Liboire.
Beauce, Div. B,	Ste. Martine,	Sept. 30,	Pierre Fortier,	Lambton.
Beauharnois,			W. Martin,	St. Ls. de Gonzague.
Berthier,	Berthierville,	Sept. 22,	G. Allard,	Berthierville.
Bonaventure,			M. LeGallais,	Paspebiac, West.
Brome,	Brome,	Sept. 1, 2, 3,	G. F. Hall,	Brome.
Chambly,	St. Bruno,	Sept. 9,	A. Charron,	St. Hubert.
Chateauguay,	Ste. Martine,	Sept. 8,	N. Mallette,	Ste. Martine
Drummond,			J. C. St. Amand,	L'Avenir.
Gaspe, Div. A,	Cape Cove,	Oct. 27,	J. J. H. Balleine,	Cape Cove.
Huntingdon, A,	Huntingdon,	Sept. 10, 11,	W. F. Stephen,	Huntingdon.
Huntingdon, B,			R. Ellerton,	Hemmingford.
Iberville,	St. Alexander,	Sept, 8, 9,	J. E. Boivin,	St. Alexander.
Jacques Cartier,	Strathmore,	Sept. 2,	J. S. A. Ashby,	Lachine.
Joliette, A,	Joliette,		J. O. Guilbault,	Joliette.
Joliette, B,	St. Jean-de-Matha,		J. O. Leveillé,	Ste. Marthe.
L'Assomption,	L'Assomption,	August 27,	I. J. A. Marsan,	L'Assomption.
Megantic, A,			J. B. Campbell,	Campbell's Corner.
Laprairie,	Laprairie,	Sept. 15,	A. Matte,	St. Constant.
Laval,			J. Gagnon,	Ste. Rose.
Maskinonge,	Louiseville,	Sept. 10,	C. Caron,	Louiseville.
Megantic, B,	Plessisville,	Sept. 10,	J. B. Vallee,	Plessisville.
Missisquoi,	Bedford,	Aug. 26, 28,	C. O. Jones,	Bedford.
Montcalm,			J. E. E. Marion,	St. Jacques.
Montmagny,	Montmagny,	Sept. 17,	A. Proulx,	Montmagny.
Montmorency, A,	Chateau Richer,	Sept. 30,	J. Cloutier,	Riv. aux Chiens.
Montmorency, Div. B,			E. Letourneau,	Ste. Famille.
Napierville,			A. Collette,	St. Remi.
Pontiac, A,	Shawville,	Sept. 21, 22, 23,	R. W. Hodgins,	Shawville.
Pontiac, B,	St. Francois-du-Lac	Sept. 24,	P. McMahon,	Chapeau.
Quebec (county),	Quebec,		J. B. Delage,	54, Bridge St., Quebec.
Richelieu,	Ste. Victoire,	Sept. 10,	J. Desjardins,	Ste. Victoire.
Richmond,	Richmond,	Sept. 9, 10,	A. E. Main,	Upper Melbourne.
Rouville,	Rougemont,	Sept. 15, 16,	A. Ares,	Rougemont.
Shefford,			N. O. Rockwell,	Waterloo.
Sherbrooke,	Sherbrooke,	Sept. 5, 12,	H. B. Miller,	Sherbrooke.
Soulanges,	Pont Chateau,	Sept. 15,	G. R. Vernier,	Coteau Landing.
Stanstead,	Ayer's Cliff,	Aug. 25, 26, 27,	J. P. Bowen,	Hatley.
St. Hyacinthe,	St. Hyacinthe,	Sept. 8,	R. Morin,	St. Hyacinthe.
St. Johns,	St. Johns,		J. Aimé Lussier,	St. Johns.
St. Maurice,	St. Barnabé,	Sept. 24,	E. Bellemare,	St. Barnabé.
Three Rivers,	Three Rivers,	Sept. 29,	M. Pothier,	Three Rivers.
Two Mountains,	Ste. Scholastique,	Sept. 21, 24,	J. W. Sauvé,	Cote Double.
Vaudreuil,	St. Lazare,	Sept. 17,	Jos. Denis,	Vaudreuil.
Vercheres,	Ste. Theodosie,	Sept. 17,	J. H. Gervais,	1480 Bordeaux, Montréal.
Wolfe, No. 1,	Marbleton,		T. E. Evans,	Bishop's Crossing.
Wolfe, No. 2,	North Ham,	Sept. 17,	E. O'Bready,	Wotton.
Wright,			R. K. Edey,	Aylmer, Box 114.
Yamaska,			A. O. Comiré,	St. François du Lac.

Provincial Exhibition at Quebec,	Aug. 31, Sept. 5,
Fair at Valleyfield,	Aug. 18, 22,
Fair at Three Rivers,	Aug. 24, 29.

(Signed) Oscar Lessard,
Secretary, Council of Agriculture, Quebec.

TRADE WITH THE ORIENT

THE Department of Trade and Commerce has issued a special number of the Weekly Report upon the probable future of Canadian trade in the Orient. The Honourable Sir George Foster has provided an introduction expressed in his usual trenchant fashion, and pointing out that the subject is one that should interest every Canadian.

Sir George says, in part—

"Upwards of 500,000,000 people inhabit China and Japan in a vast stretch of island and continent facing our Western front door. Between lies a facile ocean now beginning to quicken beneath the swift keels of rapidly increasing mercantile fleets....On all grounds of enlightened business policy Canada and Canadians cannot afford to neglect the great and promising field which lies so advantageously opposite our Western gateways and which the Panama Canal has brought so much nearer our Eastern ports".

The report is written by Mr. R. Grigg, Commissioner of Commerce, and fully justifies the commendation afforted by the introduction by Sir George Foster.

A successful attempt has been made to avoid the wearisome character of the ordinary Blue Book and the points dealt with include both much that is new and much that is true, comprising references to the northward movement of Pacific coast export, the condition of competing countries, the astonishing results by intensive farming of a primitive character, and the work being done by the consuls of all nations, with a reference to Chinese students and the native press.

The Report upon Japan is entirely different, although equally interesting. Canadians are reminded that great problems likely to profoundly affect them are in course of solution outside the borders of Canada. Copies of the Report can be obtained from the Department of Trade and Commerce without charge, and the valuable Weekly Report of that Department deserves the attention of every Canadian. It is circulated without charge and the experience of the United States and Germany illustrate the enormous value of the work being done for Canadian export.

CANADIAN NATIONAL PARKS

"Just a Sprig of Mountain Heather"

An unusual Government publication has recently been issued by the Dominion Parks Branch of the Department of the Interior. It consists of a small souvenir booklet artistically bound in duplex leather wild grass paper and tied with an olive green silk cord. The lettering is embossed in gold and a very unique design has been chosen for the cover. The latter is cut out so as to form a sort of frame and in this is inset a spray of Canadian Heather from the Rocky Mountains Park, the purplish flowers of the heather against the wood-brown background making a very attractive colour combination. The booklet is illustrated throughout with vignettes of scenes in the Banff and Yoho Parks printed in golden olive by the offset method.

It will no doubt be a matter of surprise to many to learn that Canada possesses a heather of her own. This plant is not, as it has sometimes been called, a "poor relation" of the Scotch heather, but has a family connection and standing of its own well recognized by botanists, and is nearly allied to the Heath of the British Isles. The booklet gives an interesting account of the locality from which the souvenir was gathered, Simpson Pass, about thirty miles south of Banff, and of some of the legends and stories connected with the heather in other lands. Its main purpose, however, is to call the attention of Canadians to the National Parks of the Dominion, not only to the attractions they offer to those who are able to visit them, but also to their value in the national life. Their commercial potentialities are somewhat startling. It is pointed out that owing to the increasing modern taste for travel, striking scenery has become one of the most valuable sources of revenue a nation can possess. The tourist revenue of Switzerland per year is placed at 150 million dollars, that of France at 600 millions, that of Italy at over 100 nillions. The sum which Americans annually spend abroad is estimated at the enormous total of five hundred million dollars. It would appear, therefore, that the creation of national parks, which are one of the best means of attracting and providing for tourist travel, may well be considered,as it is now being considered in the United States, as a "solid business proposition".

It is on other grounds than the commercial, however, that the parks lay clain to recognition. Chief of these is an aid to producing efficient citizens. These great natural reserves are reservoirs of vitality for the race. As an antidote to the ills of over civilization and the complex life of modern cities, they offer the opportunity for life in the wilderness and the best sort of recreation where fresh air, sunshine and beautiful natural scenery are combined. The problem of the preservation of the vitality of the race is admitted by all conservationists to-day to be the first of all conservation problems, and the value of parks, playgrounds and recreation in this respect is eacn year being given a larger place.

The educational and patriotic influence of the parks is also touched upon as well as the work which the Dominion Parks Branch is doing in the preservation of native wild life in connection with the buffalo, elk, antelope, etc., as well as bird life. There is also pointed out the need for the creation of Historic Parks as a means of preservation for our historic sites, many of which we are allowing to disappear.

A new line of development which is worthy of consideration is suggested, viz: the provision of national parks near our congested centres of population. All modern town planning makes provision for parks and playgrounds within the city itself, but while these are useful and necessary they provide a means of recreation for a few hours at most. The national parks would reserve large areas where people would be free to go for as long as they desired. Such parks would be, in reality, 'people's estates' and would afford to the ordinary citizen many of the advantages which the man of wealth possesses in his country estates. In the words of the booklet they would be "places where the poor could get a summer cottage or camp site for a nominal rental, where boys and men could camp and fish and study nature, where the sick and delicate could find new stores of health in the great out-of-doors, by right of citizenship, without leave or hindrance from anyone".

There is still, within easy reach of many of our large cities, land available for such a purpose which is either public domain or procurable at low cost. It would seem worth while considering the advice given by Ambassador Bryce in Ottawa, before his return to England, namely, that the time to set aside public domains for the future needs of the people is now, not when the encroachments of civilization have rendered this almost impossible.

THE COUNTRY FLOUR MILLS OLD AND NEW

The condition of the country flour mills to-day is a matter for serious consideration. With the advent of roller-made flour, the grist mills equipped with old fashioned stones are slowly but surely losing their patronage, and at the present time about 60% of these mills are lying idle. There are numerous instances where farmers have ceased wheat growing, owing to the expense and inconvenience of the antiquated grinding facilities in their locality, and have been obliged to drive miles to the nearest general store and pay high prices for their supply of flour. But when a small roller mill has been installed in their neighborhood they have again gone in for the sowing of wheat on a very much larger scale than before, and derived the benefit from the new roller system of procuring the best quality of flour made from their own wheat. This is the case with one of our major mills installed at Coaticook in Stanstead county. Reports show that more seed wheat was sold this year than ever before.

Stone-made flour cannot compete with the roller-made flour, either as regards quality or the cost of production.

Therefore, what is the solution of this problem? The only answer is,—establish small roller flour mills which can now be secured with a capacity of 25 to 40 barrels per day.

The next question to consider is -what is the best style of flour mill to buy ? There is a really efficient and economical mill on the market today, and that is The Midget Roller Flour Mill, manufactured and sold by The Canadian Fairbanks Morse Co., Limited, of Montreal and Quebec.

Lack of space will not allow a full description of this mill, but briefly the following are the most salient features.

(1) It will make flour which will compete successfully with the product of large, long system mills.

(2) No previous milling experience is necessary to operate it.

(3) It is what is called the short system single frame mill and has been successful everywhere.

(4) The Midget can be installed and operated for about one half the cost of any other satisfactory mill of similar capacity.

These claims are large, though not extravagant, as experience has shown what results the Midget Mill is giving to its many users all over the world.

One elevator only is employed in the Midget Mill and this is built into and forms part of the frame. Owing to the short quick process employed the flour is kept clear and bright, and its natural color is preserved and its volatile oils are not evaporated.

The cost of a 25 barrel Midget Mill complete with oil engine, feed grinder, necessary scales, but not including the building is $3300.00.

These prices include the services of an expert to superintend the erection of the Midget Mill and to give full instructions as to its operation.—Advt.

AGRICULTURAL CO-OPERATION

The Wisconsin experiment station has issued Bulletin No. 238, on agricultural cooperation. This is one of the best bulletins on the subject we have yet seen. Professor B. H. Hibbard, formerly with the Iowa Agricultural College, and now with the University of Wisconsin, has thoroughly studied cooperation in this country and abroad. In Bulletin No. 238 he explains in simple language just what farmers must do if they are to make a success of cooperation. He points out the necessity of cooperators being well acquainted with each other. He advocates as a general principle the "one man, one vote" principle in the management of cooperative concerns except under special conditions. The management of a cooperative concern he thinks should in general lie with the board of directors; and they should provide for a simple bookkeeping system and a method of auditing the books. A manager should be hired to attend to the details of the management. There should be no secrets in management, but on the other hand it is well to keep out curious and meddling folks who have no true desire to further the cause of the concern.

Cooperation has been developed in Wisconsin to a further extent than in any other state of the middle west. They have learned things in Wisconsin, and they have drafted good laws to govern the formation of cooperative associations. The Wisconsin law of cooperation is quoted in this bulletin, and sample articles of incorporation, constitution and by-laws of cooperative societies are reproduced.

Wallaces' Farmer

The JOURNAL of AGRICULTURE

AND HORTICULTURE

Volume 18 *October 1st 1914* *Number 4*

SHORTHORN BULL HEADING ONE OF QUEBEC'S BEST BEEF HERDS
OWNED BY F.M. CROMWELL, M.P. COOKSHIRE.

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

REPEATING SHOTGUN

Solid Breech
Hammerless Safe

EVEN if you are not shooting a Remington-UMC Repeating Shotgun yourself—you have seen it in action at the traps or in the field.

You hear the opinion expressed by keen sportsmen about it—"Finest gun of its kind."

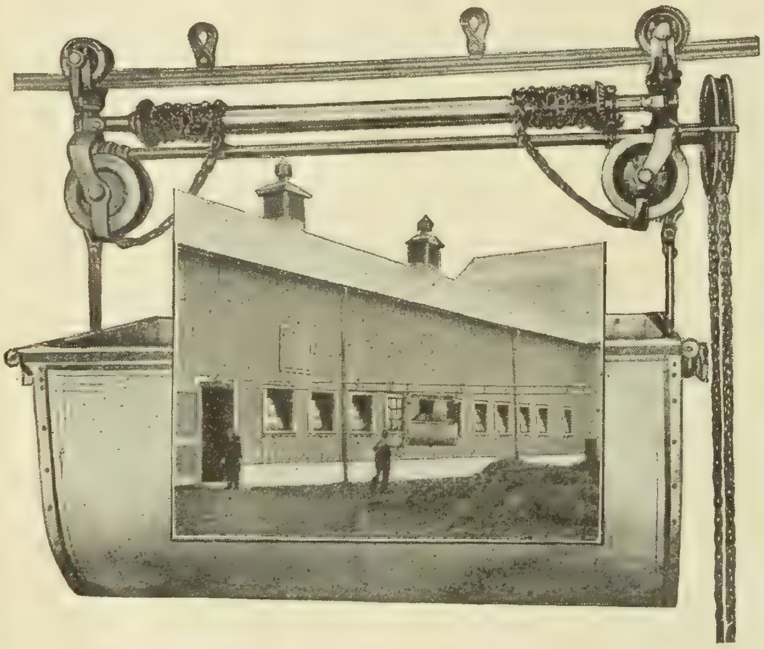
A pump gun that you can depend on—Breech mechanism perfected by the century-experienced Remington-UMC inventors.

Get your dealer to show you the Remington-UMC Pump Gun—the dealer who shows you the Red Ball Mark of Remington-UMC.

To keep your gun cleaned and lubricated RIGHT, use Rem Oil,
the new powder solvent, rust preventative, and gun lubricant.

REMINGTON ARMS-UNION METALLIC CARTRIDGE CO. Windsor, Ontario

LOUDEN
LITTER CARRIERS



Make Easy Work
—Stop Drudgery
—Save Expense

STABLE drudgery ends with the advent of a LOUDEN Litter Carrier. Time and labour are saved, and stable cleanliness maintained with the least outlay of time and energy. If you do the stable cleaning yourself a LOUDEN litter carrier outfit will be a boon. If you have valued hired help, it will assist you in retaining their services, and in getting value for the wages paid.

Write for catalogue and name of nearest LOUDEN dealer. There's one in every town.

LOUDEN MACHINERY CO., Dept. 24 Guelph, Ont.

"Everything for the Barn" 2

Pratts

NATURE'S OWN PERFECT TONIC AND CONDITIONER. Makes hens lay regularly. Acts directly upon the digestive and egg-producing organs. Tones up their entire system. Keeps them in vigorous health. Gives YOU larger profits.

Pratts Poultry Regulator

Promotes Growth.
Shortens the Moult.
Insures Fertility.
Prevents Disease.

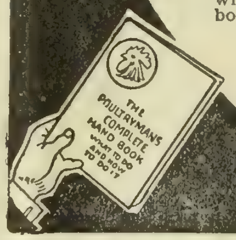
At your Dealer's: 25 lb. pail, $2.50; 100 lb. bag, $9.00; also in packages at 50c. and $1.00.

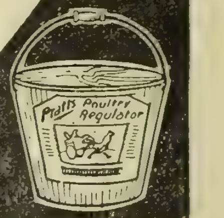
Your Money Back If Not Satisfied

Pratts Powdered Lice Killer instantly rids your fowls of lice and mites. In sifter top cans at 25c. and 50c.

Send 10c. For This Poultry Book

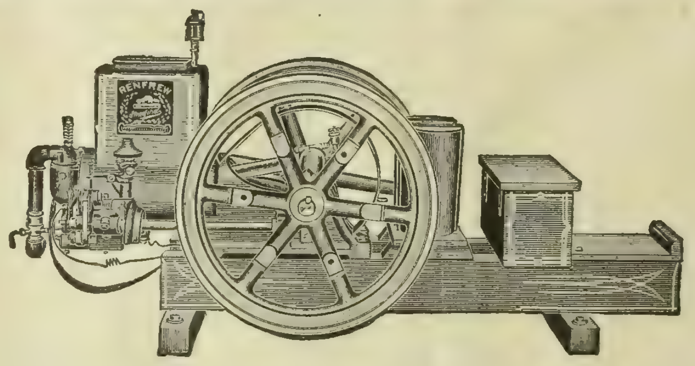
Write your name and address on margin of this advertisement. Then mail it to us with 10c. for "The Poultryman's Handbook," 160 pages, richly illustrated.


THE POULTRYMANS COMPLETE HAND BOOK



PRATT FOOD CO.
of Canada, Limited
Dept. 8
TORONTO

P13



How's This For Economy ?

Mr. S. J. McDonald of Avonmore, Ont., is glad he bought a Renfrew Standard gasoline engine Read what he says:—

Regarding the 6 H.P. Renfrew Standard gasoline engine sold to me some months ago, I have used it for cutting wood and have cut about 2,000 cords and am pleased to say I have had excellent satisfaction with it. I found it very easy to start even on the coldest days. It never gave us any trouble whatever, and only used on an average of 4 GALLONS OF GASOLINE PER 10 HOUR DAY. I am pleased to recommend it to anyone intending to buy a gasoline engine.

Mr. McDonald's letter is only one of scores received this year from buyers of the

Renfrew Standard
It starts without cranking

These letters bear out our contention that we have the most economical carburetor built. They prove that all we have claimed about ease of starting is more than justified. They more than uphold all our advertised claims. We are sorry we haven't the space to print these letters, but we have an engine booklet that describes the Renfrew Standard. Write for a copy.

The RENFREW MACHINERY Co., Limited

HEAD OFFICE & WORKS, RENFREW, ONT
Agents Almost Everywhere in Canada.

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 101,560
FRENCH, 92,000
ENGLISH, 9,560

Volume 18 | OCTOBER 1st 1914 | Number 4

EDITORIAL

COOPERATIVE BANKS FOR FARMERS

We are glad to be able to reprint for our readers' benefit the full text of the address of Mr. Alphonse Desjardins to the Social Service Congress, held in Ottawa last March.

Mr. Desjardins is the originator of a system of co-operative banking for rural communities which has been taken hold of by our French-speaking fellow-countrymen to such an extent that there are now about 150 of these banks in successful operation. They supply a very real want in our rural communities. The incorporated banks, as Mr. Desjardins points out, do not provide credit for farmers on such terms nor to such an extent as the demands of the agricultural industry require. Co-operative banks, properly conducted, do provide such credit economically.

And Mr. Desjardins outlines very clearly the policy which the co-operative banks ought to follow. As in all financial undertakings integrity, foresight and good judgment are essentials to success. That such qualities are not rare in our Canadian rural communities is abundantly evidenced by the unqualified success which has so far attended the co-operative banks.

The present period of high prices and disturbed financial conditions appears to offer an exceptionally favorable opportunity for the organization of farmers' banks. To bring about the agricultural expansion which is being so generally urged as a patriotic duty to-day, an adequate system of farm credit is essential. Let the farmers establish their own systems promptly and not wait for speculators to take advantage of the situation for their personal profit.

WELL DONE, QUEBEC BUTTER-MAKERS!

We heartily congratulate the Quebec Buttermakers who sent samples of the products of their making to the Canadian National Exhibition at Toronto.

The awards as will be seen by a glance at the list on another page have evidently been merited and are the logical and inevitable result of long painstaking training of Quebec dairymen by the Provincial Department of Agficulture. Some of us at least are aware of the untiring efforts of the officials of the Department for many years to improve the quality of the butter and cheese of Quebec, and it must be a source of satisfaction to these officials to find their efforts now crowned with such great success. In the competition were buttermakers from every province of the Dominion, and the display of creamery butter was the largest ever made in Canada.

So sweeping was the Quebec victory that "Canadian Farm" is now asking the Ontario dairymen to explain the situation. To us the explanation is clear: the butter-makers and dairymen of Quebec are better trained, the grass of Quebec furnishes better milk, the system of handling the milk at the factory is superior, and the method of sale of the product on the market conduces to greater efficiency among the makers.

DEATH OF DR. WILLIAM SAUNDERS

The First Director of the Dominion Experimental Farms

In the death of William Saunders, L.L.D., C.M.G., which occurred at his home in London, Ontario, on September thirteenth, the Dominion of Canada loses a citizen who in his time rendered to her a service whose value can scarcely be overestimated.

Born in Devonshire, England, in 1836, Dr. Saunders came to London, Canada, at the age of twelve years. He engaged in the drug business in that city but also became interested in horticulture. To this hobby he devoted himself with such enthusiasm and with such broad intelligence that when the establishment of a system of experimental farms was decided upon by Sir John Carling in 1884, Mr. Saunders was appointed to collect information upon the work of other countries in this direction.

In 1886, he was appointed Director of the Dominion Experimental Farms. In the twenty-five years during which he held this important position, he not only superintended the manifold business of the Farms but also engaged in breeding experiments which have resulted in the development of varieties of wheat and apples specially adapted to the climate of the Northwest.

As the result of numerous tests of varieties of cereals, forage plants, vegetables, fruits and shade trees, gathered from all parts of the world, he was able, not only to give authoritative advice to the farmers of all districts in their choice of seeds, but also to distribute seeds of high quality directly to them, thus greatly increasing the annual production of the farms.

It is no exageration to say that by this experimental work, Dr. Saunders contribute more to the wealth of Canada than the greatest captain of industry or the greatest railway builder of his generation. His reward was not in the way of wealth but in the personal satisfaction which comes from honest and thorough work and in the honors conferred upon him by his fellow workers. He held high offices in many scientific societies, he was granted honorary degrees by several universities and he was created a Commander of the Order of St. Michael and St. George by King Edward VII in 1905.

Dr. C. E. Saunders, Cerealist of the Dominion Experimental Farms, is a son of the late Director and three other sons are engaged in scientific work elsewhere, while a fifth devotes his attention to music. To them, as well as to Mrs. Saunders and Miss Saunders, the Journal offers its condolence upon the loss they have sustained and its congratulations upon the memory it is theirs to cherish.

REBELS AGAINST TRADITION

The great majority of farmers are children of tradition. They are content to follow the beliefs and practices of their fathers with regard to the cultivation of crops, the feeding and breeding of stock and the marketing of these products. This tradition was very well in its time, but the times have changed and the world has moved on. No tradition is perfect; the best brings only a passing period of triumph and stability. The science of agriculture rests for a moment but it will travel further; to rest forever would be its ruin. Every tradition has good features that should be conserved but it is at its best when it is being attacked and broken. In a sense, therefore, the greatest triumph that it can accomplish is to rear noble and worthy rebels.

Fortunately for agriculture, there are always a few rebels against the old traditional way of farming. They keep in touch with the advances in scientific methods and attempt to apply them in actual practice. Many instances might be cited to show how the rebel spirit is shattering the old traditional methods. Not long ago fruit growers did not spray their orchards, for there were few enemies to combat. In recent years in spite of the advent of these enemies, many fruit growers persisted in the old practices with the result that great losses occurred. The rebels, however, have been able to save their crops of fruit by careful spraying. Again the rebels have made gains by applying the principle of co-operation in buying and selling.

In the growing of crops and the feeding of stock great improvements have been effected by the introduction of rotation of crops, after-harvest cultivation and fall plowing, better selection of seed, the silo and the growing of clover. Such changes have been brought about by rebels to the old traditional methods.

The path of the rebel in agriculture is a thorny one at first. He is usually termed a crank or a fool by his neighbors until they are convinced of their error by his successes. Agricultural Colleges and live agricultural departments are the greatest and noblest rebels, and for this very reason they are often criticized by the conservative farmer. Time will vindicate their rebellious actions. It is gratifying to find that every year increasing numbers of young men are attending the agricultural colleges and joining the useful band of noble rebels against tradition.

CONTENTS

EDITORIAL.—Co-operative Banks for Farmers; Well Done, Quebec Butter-makers! Death of Dr. William Saunders; Rebels against Tradition; The War, the Unemployed and the Farmers—An Appeal; A Word to Canadian Producers.

ORCHARD AND GARDEN.—Annual Summer Meeting of the Quebec Pomological Society; A Strawberry Pest; Fruit Culture in the Province of Quebec; The Fruit Crop; Bacteriology of Canning; The Wintering of Bees; Tillage or Sod Mulch in Orchards.

FARM AND FARM CROPS. — Co-operation among Farmers; Canada's Great Eastern Exhibition at Sherbrooke; Compton County School Fair; Agricultural Instruction at the Provincial Exhibition; Concrete Cellar-steps and Hatchway; Handling Silage; Lifting Water with Siphon; Lifting Water with a Ram; Keeping Surface-water out of Driven Well; Ploughing a Neglected Art; Agriculture in the Rural Schools of Ontario; How to avoid Silo-filling Accidents.

LIVE STOCK.—Auction Sale of Breeding Stock; Facts about Sheep; Official Canadian Ayrshire Records; Record of Performance Test; Developing a Dairy Herd.

DAIRY.—A Magnificent Gift to Great Britain; Reasons for the Quebec Success in Butter at Toronto; Great Victory of Quebec Butter-makers at Toronto; Butterfat plus Over-run equals Butter; How to Reduce Cream to any desired Percentage of Fat; An Experiment with Tuberculosis.

POULTRY. — Fattening means Profits; To kill Poultry properly. To make a fattening Crate; Rural School Fairs a Success; New Standard Breeds; Standard Weights for Leghorns and Andalusians Notes.

WOMAN'S WORLD. — Lennoxville Homemakers' Club; Household Science Exhibit at the Shawville Fair; The Canning of Fruits and Vegetables; Cookery Exhibit at the Granby Fair; The Fair at Sherbrooke; Score Cards for Judges of Cooking; The Children's Homer.

GENERAL INTEREST.—Canning — Its Importance; Heredity as an Influence in Milk Production (cont'd); Sheep and Swine at Sherbrooke; Our Lads to the Front; The Farmer's Wife.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

THE WAR, THE UNEMPLOYED AND THE FARMERS. AN APPEAL

THERE is every indication that a very large number of men will soon be out of employment in cities through the dislocation of industry and the temporary abandonment of large public undertakings on account of the war. At this time it becomes the duty of all classes to help not only the families of those who have gone to the front but also those who have lost the means of livelihood by reason of the war.

Many of the unemployed have, no doubt, experience in farm work and many of the inexperienced would be willing to learn. Here is an opportunity then for the farmers of this Province to benefit not only themselves but also those out of work. The world's supply of food products will certainly be greatly lessened this coming year, since the nations at war will not be able to produce as much as usual. At this time, therefore, for the farmers to increase the supply of food stuffs would not only be an act of the highest patriotism but also a profitable proposition.

In order, however, to undertake the necessary increase in acreage of cultivated crops it would be necessary to make additional preparations of many kinds on the farms during the winter, spring and summer months, and this can only be done by the employment of extra help, if such can be procured on reasonable terms.

Believing that the farmers can with advantage make use of many additional laborers during the coming year, we do not hesitate to advise them to do so. However, before taking any definite steps to place the farmers in direct touch with the probable large number of unemployed, we would be glad to hear from the farmers themselves regarding the plan proposed. We trust they will feel quite free to discuss the matter with us. Future action will depend largely on the response to this appeal.

A WORD TO CANADIAN PRODUCERS

CANADIANS are intensely interested in the gigantic struggle now staged on the battlefields of Europe.

There is being fought out and there will be decided the mastership of the Old World—the control of the seas—the question of liberty and democratic government in Europe.

Though primarily a quarrel between three great European powers, it has developed into a war for the existence, integrity and supremacy of the British Empire.

The British Empire is now or soon will be represented on the battlefield by troops from the Motherland, Canada, Newfoundland, Australia New Zealand and South Africa which releases British soldiers and substitutes her own in their place.

Involved in this war is the question of commercial ocean transport and overseas trade.

For years Germany has made superhuman efforts towards building up a great industrial system at home and a vast overseas trade with its attendant strong commercial marine.

Comparing 1893 with 1913, her industrial output has wonderfully increased, and the same is true in reference to her export of industrial products.

Her sea tonnage from 1,511,579 to 3,153,724.

Her foreign trade from $1,678,780,600 to $4,966,298,400.

In 1913 her exports were as follows:—

To Great Britain	$342,291,600
Canada	14,473,833
Australia	21,063,000
South Africa (British)	11,162,200
New Zealand	2,546,600
United States	169,741,600
France	187,996,200
Russia	209,440,000
China	29,226,400
Japan	29,202,600
South America	157,960,600
all other countries	1,227,862,387
Total	$2,402,967,000

Under present war conditions she has lost for the time being nearly all this trade; her industrial production has been greatly reduced and her commercial marine has been practically swept from the seas.

What this means to Germany, we can all see; a total loss during the continuance of the war and a long period of struggle after ensuing peace to regain even a part of her lormer proud and profitable position, and a probable total loss of her expensive and hardly-bought colonial possessions.

What we do not so clearly see is that this immense void in production and distribution must be filled—others must step into her place to make and distribute what Germany has for the time been forced to surrender.

For the British Empire—home and overseas—the instant pressing duty is to possess itself of a generous share of the production and trade thus lost to Germany, and so to reap the advantages of a great industrial and commercial victory which shall in some measure compensate the costly sacrifice of war. Not only should we fill to the greatest possible extent the void thus created, but we should make our position so strong in these markets as to secure ourselves from our being ousted by Germany hereafter.

Whilst a comparatively small number of our manhood fights the battle for Imperial existence and control of our ocean highways, those who remain should with spirit and energy throw themselves into the task of taking possession of the markets from which our enemies have been driven and supply them with the products of our own fields and factories.

Here is a peaceful field of operation in which we can carry on a bloodless but most effective and profitable warfare.

First let us fill as far as possible the call for the $16,000,000 worth of goods with which Germany and Austria provided us last year, and which will this year be absolutely debarred. And what we cannot supply ourselves let us purchase from Great Britain and the other parts of the Empire. Let us covenant together to buy goods 'made in Canada,' 'made in Britain' and 'made in the Empire'. Thus shall we give employment and the profits of production to the Empire's home workers.

Then let us find out the details of what Germany and Austria has produced and sold to other countries and set ourselves to supply as large a part of this as possible.

Whilst our soldiers and sailors preserve our homes from attack and our ocean highways open and secure for transport, let us enter upon these abandoned markets and possess them as far as possible.

Here are markets for hundreds of millions ot dollars worth of products, the making of even a portion of which will keep our industries going and give employment to hundreds of thousands of our people. If consumers determine to buy only Canadian and Imperial goods, and producers to provide them at lowest prices and of good quality, a co-operative work of inestimable value will have been begun.

Beginning with this number of the Bulletin will be published a series of statements designed to illustrate the opportunities which the present war conditions open to Canadian business enterprise and which the undersigned most earnestly hopes will be utilized to the full.

GEORGE E. FOSTER,
Minister of Trade and Commerce

Ottawa, September 1, 1914.

THE GARDEN AND ORCHARD

ANNUAL SUMMER MEETING OF THE QUEBEC POMOLOGICAL AND FRUIT-GROWING SOCIETY

Held at Abbotsford, Sept. 9-10th; A good Attendance with excellent Addresses on Timely and Practical Subjects

As Mr. J. M. Fisk stated in his address of welcome to the members of the Pomological Society, this meeting celebrated not only the twentieth year of its existence as a Society, full of good works, but also the place of organization. Abbotsford has the honor of being its birth-place, and of the original members only Mr. Robert Brodie and Mr. J. M. Fisk were present at the meeting. It was largely through the instrumentality of the late Mr. Chas. Gibb of Abbotsford that the original meeting was called.

The following persons outside of Abbotsford were present: Professors Bunting and Lochhead of Macdonald College, Father Leopold of Oka Agricultural College, Mr. Peter Reid of Chateauguay Basin, Robert Brodie of Westmount, Rev. H. A. Dickson of Rectory Hill, Mr. Geo. Edwards of Covey Hill, Mr. M. B. Davis of the C. E. F. Ottawa, Mr. J. C. Chapais of St. Denis, Mr. R. A. Rousseau of Acton Vale, Mr. Cloutier of Rougemont, Mr. S. Roy of Quebec, Mr. C. E. Petch of Covey Hill, and P. J. Carey of Toronto. The fruit-growers of Abbotsford were well represented at the meetings, among whom were noticed: Messrs. Fisk, Crossfield, Harley, Holey, Buzzell, Slack, McCarley, Marshall, Gibb, Gillespie, Roach, Rowell, Mitchell and others.

A group of Prominent Fruit-growers and active members of the Quebec Pomological Society at Mr. Crossfield's near Abbotsford

The meetings were held in the Town Hall, where at the same time was held the Annual Exhibition of the Abbotsford Fruit-growing Society.

The exhibits was hardly as large as in some former years, but the quality of the fruit shown was excellent and attracted much admiring comment from the visitors. It was especially noted that owing to the general adoption of spraying and other modern methods of scientific fruit culture the apples were particularly fine, not merely well sized and colored, but with their skins absolutely free from any sign of blight.

In his Presidential Address Prof. Bunting of Macdonald College spoke of the good work of the Demonstration orchards in showing how to grow good fruit. The result has been that, whereas some thought the Fameuse was passing away on account of its susceptibility to "scab", this queen of fruits is again strongly established among the fruit-growers through the fact that it has been shown that 'scab' can be prevented by spraying. Reference was made also to the high quality and abundance of fruit this year, and the likelihood that smaller prices than usual will prevail. This could be prevented to a large extent by proper co-operation. Congestion may occur but over-production of fruit is hardly possible nowadays. In closing, the President paid a tribute to the valuable work of the late Mr. Charles Gibb for the improvement of fruit-growing in Quebec.

The town Hall at Abbotsford where the Pomological Society held its Summer Meeting

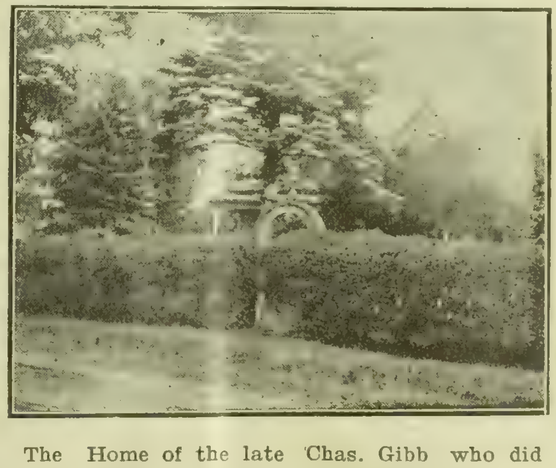
The Society was welcomed to Abbotsford by Mr. J. M. Fisk, who was one of the founders of the Pomological Society, and he, in welcoming the delegates and members, remarked that it was fitting that they should hold their meeting at Abbotsford, where the society was formed twenty years ago. During that time the society had done a vast amount of good, which was easily seen not only in the fruit at the exhibition but in the splendid orchards which were in full and profitable operation throughout the countryside.

This address was replied to by Mr. Robert Brodie, of Montreal, another of the original members of the Society.

Mr. C. E. Petch, Field Agent of the Division of Entomology, read an instructive paper on "Orchard Sprays" in which he gave the mode of preparation and value of the different sprays now in use. He warned orchard owners against using untried sprays until they had been reported upon by the government agencies appointed for that purpose. A long discussion followed in which many of the members took part.

At the evening session Mr. J. C. Chapais of St. Denis read a paper on "Latitude and Hardiness" in which he maintained that hardiness is an inherent character of each variety which is retained whether the nursery stock is grown in the Niagara district or in Quebec. An interesting discussion followed.

Mr. Robert Brodie of Westmount read a paper on "An Amateur Rose Garden", basing his remarks on his long experience in growing roses in his own garden.



The Home of the late Chas. Gibb who did much to promote fruit-growing in Quebec

Mr. M. B. Davis, of the Central Experimental Farm Ottawa, gave an interesting and instructive address on "Co-operation" and Rev. Father Leopold of La Trappe one on "Cherry Culture".

On Thursday Morning Rev. H. A. Dickson of Rectory Hill gave an interesting Report of the recent Dominion Fruit Conference held at Grimsby in which the main features of the Conference were brought out.

Reference was made particularly to the efforts to secure a standard-sized berry-box, as used in the States, instead of the four-fifths of a quart box, which is more popular with berry sellers in Canada.

Another interesting paper was presented by Prof. W. Lochhead, of Macdonald College, in which he dealt with insects which bother orchards, and the proper way to control them. Again this proved a very live topic, one on which the orchardists knew a good deal and were anxious to know more. A good deal of valuable advice was secured in this way as to what spray mixtures to use for particular pests, and the most opportune time at which to apply them.

The meeting was brought to a close with a demonstration of grading and packing apples by Mr. P. J. Carey of Toronto.

A Corner of Dr. Byers' orchard at Abbotsford. laden with fruit

After a short address on the necessity of packing fruit so that it should present a pleasing appearance, and at the same time retain its keeping qualities, Mr. Carey proceeded to show how it should be done. To this end, in the grounds around the hall, he had a mechanical grader which, when fed with apples through a big hopper, separated them into their various sizes so as to have them ready for boxing.

With a crating table, Mr. Carey then showed the proper way of wrapping and packing apples in bushel boxes, so as to give them the proper appearance to tempt people. His work in this line proved most interesting, and was watched by a crowd of apple-growers from all along the district, many of whom joined him in the work, and took practical lessons in fruit packing. The work was not made the less interesting in that the demonstration was carried out with fruit from the exhibition, comprising the choicest samples from the Abbotsford district, which is easily the best fruit-growing section of this province.

ONTARIO FRUIT OUTDONE

This feature was particularly dealt with by Mr. Carey, who expressed astonishment at the magnificent orchards he had seen, remarking that the fruit grown was far superior in its way to anything he had seen in Ontario. In the latter province, he said, the tendency was to large apples with not much color. On the other hand, the

Fameuse and Macintosh Reds, as grown in the Abbotsford district, were medium in size, but beautifully colored, and presented a much more attractive appearance than any Ontario fruit. This he in part attributed to the fact that the Ontario orchards were vigorously cultivated, while the Quebec orchards were generally kept in sod, which always produced more highly colored apples.

A resolution was adopted instructing the secretary, Mr. Peter Reid, to notify the Quebec Dairymen's Association as soon as possible of the dates of the fruitmen's winter meeting, so that dates might be fixed which would not clash, as has happened during the past year or two.

During the day a number of the delegates visited some of the large orchards in the Abbotsford district, when they were surprized at the quantity of fruit grown, despite the fact that this season is described as only fair. Some of these orchards were loaded with choice fruit, and their owners expected to ship upwards of 1,500 barrels apiece this fall. One orchard, that belonging to Dr. Byers, was particularly admired, with fifty acres almost entirely devoted to Fameuses, with all the trees loaded so that many had to be propped to protect the branches, the value of the fruit on the trees far exceeding the ordinary price of unplanted land in the district.

A STRAWBERRY PEST

THE Strawberry Root Weevil in British Columbia, with Notes on other Insects Attacking Strawberry Plants in the Lower Fraser Valley, is the subject of bulletin No. 18 of the Second series of the Central Experimental Farm. This publication, which has been prepared by Mr. R. C. Treherne, B.S.A., is based upon a careful study of the insect carried out in 1912 and 1913, by the writer, under the supervision of Dr. C. Gordon Hewitt, Dominion Entomologist. The Strawberry Root Weevil constitutes the greatest obstacle to the successful growing of strawberries in certain sections of the Lower Fraser Valley; the investigations carried out demonstrated that the control of this insect was dependent upon cultural methods and the system of cropping, and for this reason these aspects of the problem have been fully discussed in addition to the economic questions involved in the control of the weevil. Copies of this new bulletin are free to those who make application to the Publications Branch, Department of Agriculture, Ottawa.

FRUIT CULTURE IN THE PROVINCE OF QUEBEC

WE have just received a copy of a book entitled "La Culture Fruitière dans la Province de "Québec", prepared by the Rev. Father Leopold of the Oka Agricultural Institute at La Trappe. It deals comprehensively with the propagation of the fruit trees of Quebec and with the establishment, maintenance and care of apple orchards according to the most modern methods. Attention is also given to the cultivation of the plum, cherry, pear and the small fruits.

The book undoubtedly fills a long-felt want in this province, and, coming as it does from such an authority as Father Leopold, the information should be most reliable.

The fruit growers are to be congratulated in having access to this most valuable guide. We believe the book is to have a generous distribution in the province which is eminently adapted for fruit growing. We congratulate the author on the preparation of such a comprehensive, yet concise manual. Not the least valuable part of the work is the excellent series of illustrations which have been carefully prepared.

W. L.

THE FRUIT CROP

THE Fruit Crop Reports issued by the Federal Department of Agriculture September 12th and September 15th give the following information about apples:

APPLES

"The present season, so far as production is concerned, and speaking broadly for the whole Dominion, is a most satisfactory one. The crop is large and the fruit is clean and of good size. Such a condition is exceptional and if the means of distributing and marketing were normal, the growers would unquestionably reap abundant returns.

"The foreign market, however, at the present time is greatly demoralized. In practically every section of the country the growers are exceedingly pessimistic regarding the ultimate distribution of their fruit in a satisfactory manner. This feeling is particularly marked among independent growers, who have in previous years relied upon the itinerant buyers to purchase their fruit. Many of these buyers are not operating this season and even in cases where they have quoted prices, their offers are far from alluring. The consequence is that growers are practically at a loss as to any means of selling their crop. Many of them have had no experience in marketing, having formerly sold their fruit on the trees or packed in the orchard. Co-operative associations are not so seriously affected. Being groups of growers under capable management and with experience in disposing of previous crops, most of the associations have established connections upon which they can place some reliance in the present season. The average over the Dominion for early apples is 78 per cent, for all apples 78 per cent, and for winter apples 74 per cent. This gives a total crop of 76 per cent, which is an increase of 28 per cent over that of 1913".

A good crop of Fameuse and Mc Intosh is reported in New Brunswick, Quebec and Ontario. The quality is exceptionally good in all localities.

Ideal weather and the finest quality in years is reported from the Annapolis Valley. The crop there is estimated at 900,000 barrels, which is equal to 1912 and sixty per cent increase over 1913. In Ontario Baldwins are reported low and Kings a failure.

Attention of shippers is called to the fact that sailings from the Port of Montreal are very indefinite. Shippers should therefore bear in mind that they would be assuming a great risk by sending any of the early varieties to this port for trans-Atlantic shipment, without havibg received definite information with regard to space and date of sailing.

OTHER FRUITS

The pear crop in the commercial orchards of Ontario will be about 75 per cent of last year's. The Georgian Bay District reports its pear crop as double that of last year. Plums are a light crop in Ontario and peaches a failure. Grapes will be a full crop of excellent quality. Tomatoes are abundant in Ontario but loss by rotting may reduce the crop to an average one. In Nova Scotia a good crop will be harvested.

HARVESTING

On account of the very exceptional conditions which are at present existing throughout the world, there are certain features which Canadian fruit producers should keep in mind when harvesting their crop. There is a general laxity on the part of consumers in making purchases, and the demand for any inferior fruit from present indications, will be slight. It is therefore desirable that only the better grades should be packed and shipped, at least until a more equable state of affairs is reached. There should be a satisfactory home market for the better grades, and the growers would be wise to limit their shipments to such grades and hold the lower grades for later sales. The main thing to bear in mind is that, just as long as the demand for fruit is limited, it should be supplied only by the better grades and every barrel of No. 2 or No. 3 apples that is placed on the market, interferes to just that extent with the sale of higher grades.

LABOR

Fruit-growers and packers who are desirous of securing help to harvest the fruit crop can do so by applying to the Dominion Immigration agent. Mr. John Hoolihan, 172 St. Antoine St., Montreal.

THE BACTERIOLOGY OF CANNING

THE canning industry is only of recent date, and every adult will remember the time that this simple expedient of preserving by heat was unknown and fruits and vegetables had to be preserved in sugar or a pickle which usually changed the original qualities of the products.

When we want to keep fruit and vegetables in a fresh state we are confronted with the difficulty that they spoil or ferment after a few days. This spoiling is due to the growth of bacteria. These bacteria live in the soil, and as fruit and vegetables are often in contact with the soil they are naturally covered with these bacteria.

Therefore, in order to get rid of these bacteria, we put our products in air-tight cans or sealers and boil them for half an hour or longer. This treatment kills all the living bacteria but is unfortunately not sufficient. For in the soil, and therefore on the vegetables, we find not only the living bacteria but also so-called bacterial spores, a kind of seed produced by the living germs. These spores are not killed by boiling but only softened, and grow easily into bacteria when the temperature is favorable. Therefore, we keep our sealers in a warm room until the next day, by which time nearly all the spores have changed into bacteria, and we kill these bacteria by boiling again for half an hour or longer. In the majority of cases the cans will keep after this second heating, but there is a possibility that some spores have escaped destruction, so we dispose of these spores by heating also on the third day. When we have to do with acid fruit or vegetables, e. g. tomatoes, this third heating is usually superfluous as bacteria are more easily killed in acid surroundings.

Recently, boilers have come on the market for household use, in which we can heat above the boiling point of water and give an overpressure of several pounds. In such a boiler a second heating will kill all the bacteria and spores. This makes the whole much more simple. However, in case of fruit this method is out of the question as such a heat would reduce the fruit to a jelly.

For ordinary canning we have thus the following rules, which have to be varied for individual cases:

Heat open sealer, 10 minutes to remove air.

Boil closed sealer 40 minutes to kill all living bacteria.

Leave sealers over night in a favorable temperature about 70 F.

Boil sealers again for 40 minutes (second day).

Leave sealers over night at about 70 F.

Boil sealers on the third day for half an hour.

For pressure canning, we have:

Heat open sealer for 10 minutes to remove air.

Heat closed sealer at a pressure of 5 lbs. for 20 minutes allowing sufficient time to reach boiling point first.

J. VANDERLECK

THE WINTERING OF BEES

Preparations for Successful Wintering

THE most important problem which presents itself to the bee-keeper is the question of wintering his bees successfully. On sucessful wintering depends not only the safety of the investment represented by the bees but also the success or failure of his honey crop in the ensuing year. Bees that do not come through the winter in good condition take a long time to build up to normal strength, and thereby a certain amount of honey surplus is lost.

Much has been written, and probably more will be written, on the problem of wintering. There are two ways of wintering bees. For a number of years the writer has had the oportunity of observing the two methods in practice at once. Without going too deeply into minor details I wish to point out the *pros* and *cons* on each side of the question.

The larger percentage of bee-keepers winter their bees in the cellar—most often the cellar of their dwelling-house. Special repositories have been built by professional bee-keepers which are provided with systems of ventilation and provision made for maintaining quietness and an even temperature. These are very succesful in operation. Most bee-keepers, however, make use of a less expensive plant. A cellar used for wintering bees should be dry and warm enough so that water does not freeze in it even in the coldest weather. The part of the cellar used for the bees should not be exposed to draughts and should be kept in darkness, absolute darkness. There should also be two or three windows for sake of ventilation. The ideal temperature for wintering bees in the cellar is 45° F. and if the temperature goes much above this point open the windows slightly to reduce the temperature. If it drops much below 45° it is advisable to introduce heat to keep the temperature up.

The advantages of cellar wintering are these: The bee-keeper has absolute control of the temperature and also of the time when he will set his bees out of doors, so that if spring should prove cold and late he can keep his bees inside until settled warm weather comes. This is an important point. Bees wintered in the cellar do not require to be fed so much as those wintered out-of-doors as there is a difference of two or three pounds in favor of inside wintering.

Against these advantages must be placed the transport of the bees into the cellar and out again. The hives may be brought into the cellar at various times, but when bees are put out in the spring every hive should go out on the same day. Moving bees to and from the cellar is hard labor and entails continuous lifting and carrying. They must be set out in the spring as soon as the weather permits, and this cannot be delayed. On account of these latter reasons some bee-keepers prefer the out-door method.

Bees wintered out of doors require to be warmly packed in some light dry porous substance which will readily dry out when damp and which will allow vaporized moisture to pass readily through it. Dry leaves, maple are the very best, make the best of packing for the winter and any quantity of leaves can be obtained in the fall after they are on the ground. The hives are placed singly into an outside case some four inches larger on all four sides than the size of the hive itself and with about ten inches of space on top. The bottom of the box should be covered a couple of inches deep with leaves and the hive placed thereon. To provide for an entrance, a small box with open sides leads from the entrance of the hive proper to the outside. The hive is then packed solidly in leaves on four sides and on top for a depth of ten inches or more; or instead of packing the top in leaves a big bag of coarse shavings seven or eight inches in depth can be used. A sloping cover goes over all.

This is one method of out-door wintering that is succesful. Another plan that is coming to the front is what is known as the "tenement" hive. The principle is precisely the same as out lined above except that four hives are placed back to back and side by side in a case built large enough to allow four inches of space all around the outside of the group. This last method economizes on wintering cases and is consequently cheaper to undertake.

Whether bees are wintered inside or out—the method of preparing them for the winter is the same. Bees should be looked over and their stores estimated by the twentieth of September. They should be fed as early in October as possible or during the latter part of September. If they are fed during a time when bees are flying, extreme care should be taken to prevent robbing. Feed only at night after bees have ceased flying. Keep all entrances contracted and do not expose any syrup. It is easier to prevent robbing than to check it after it is started. Syrup for winter stores should be made up in the proportion of two parts white granulated sugar to one of water. If bees are fed late in October a larger proportion of sugar should be used. In wintering bees out-of-doors it is necessary to remove covers from hives and also the sheet of oil-cloth over the frames and substitute a piece of burlap that will allow the moisture to escape freely from the cluster. Bees in the cellar should have between twenty-two and twenty-five pounds and those out-doors should have from twenty-five to twenty-seven to winter successfully. When the hives are put in the cellar the bottom boards should be removed and the hive placed about two feet above the cellar floor on planks, and piled diagonally above one another to allow the dead bees to drop from between the frames.

HARRY W. JONES,

Bedford, Que.

TILLAGE OR SOD MULCH IN ORCHARDS

THE Office of Experiment Stations, U. S., Department of Agriculture, has just received a report from the New York Agricultural Experiment Station of a test made to determine whether the apple thrives better under tillage or in sod. The experiments were begun in 1903 in an orchard of 9½ acres of Baldwin trees, 40 feet apart each way, set in 1877. Of these, 118 are in sod and 121 under tillage.

The experiment was divided into two five-year periods. During the first period, the orchard was divided into halves by a north and south line; during the second period, by an east and west line. One quarter of the orchard, then, has been tilled ten years; another tilled five years and then left in sod five years; the third quarter has been in sod ten years and the fourth quarter in sod five years, then tilled five years. The tilled land was plowed each spring and cultivated from four to seven times. The grass in the sod plat was usually cut once, sometimes twice. In all other operations the care was identical.

Briefly summarized, the following is a statement of the results attained:

The average yield on the plat left is sod for ten years was 69.16 barrels per acre; on the plat tilled ten years, 116.8; difference in favor of tilled plats, 47.64 barrels per acre per year. The fruit from the sod mulch is more highly colored than that from the tilled land. The sodded fruit matures from one to two weeks earlier than the tilled fruit. The tilled fruit keeps from two to four weeks longer, however, than the sodded fruit; it is also better in quality, being crisper, juicier and of better flavor.

The average gain in diameter of the trunks of the trees in sod for the ten years was 2.39 inches; for the trees under tillage, 3.90 inches; gain in favor of tillage, 1.51 inches. The trees in sod lacked uniformity in every organ and function of which note could be taken. The uniformity of the trees under tillage in all particulars was in striking contrast. The grass had a decided effect on the wood of the trees, there being many more dead branches on the sodded trees and the new wood was not as plump or as bright in color. The leaves of the tilled trees came out three or four days earlier and remained on the trees several days longer than on the sodded trees. They were a darker, richer green, indicating greater vigor, and were larger and more numerous on the tilled trees.

The average cost per acre of growing and harvesting apples in sod was $51.73; under tillage $83.48; difference in favor of sod, $31.75. Subtracting these figures from the gross return leaves a "balance" per acre for the sodded plats of $74.31; for the tilled plats, of $140.67, an increase in favor of tillage of $66.36. For every dollar taken from the sodded trees, after deducting growing and harvesting expenses, the tilled trees gave $1.89.

The effects of the change from sod to tillage were almost instantaneous. Tree and foliage were favorably affected before midsummer of the first year; and the crop, while below the normal, consisted of apples as large in size as any in the orchard, the falling off in the yield being due to poor setting. The change for the worse was quite as remarkable and as immediate in the quarter of the orchard turned from tillage into sod; the average yield in this quarter was not half that of any one of the other three quarters.

The use of nitrate of soda in the sod plats greatly increased the vigor of the trees and was a paying investment, yet for the five years period they bore but a trifle more than half as much as the tilled trees.

The very marked beneficial influence on the sodded trees of adjacent kround under tillage teaches that not only should apples not be grown in sod, but that for the best good of the trees there should be no sod near them. Grass militates against apple-growing in several ways, such as lowering the water supply; decreasing some elements in the food supply; reducing the amount of humus; lowering the temperature of the soil; diminishing the supply of air; affecting the trees through the formation of a toxic compound.

There is nothing in the experiment to show that apples ever become adapted to grass. Sod may occasionally be used in making more fruitful an orchard growing too luxuriantly, Other fruit than the apple is probably harmed quite as much or more by sod so that the results of these experiments may be applied to peach, pear or other orchards. Hogs, sheep or cattle pastured on sodded orchards do not overcome the bad effects of the grass. Grass left as a mulch in an orchard is bad enough. Grass without the mulch is all but fatal—it makes the trees sterile and paralyses their growth. It is only under highest tillage that apple trees succeed in nurseries and all the evidence shows that they do not behave differently when transplanted.

American Cultivator

THE FARM AND FARM CROPS

CO-OPERATION AMONG FARMERS

(Address before the Social Service Congress, Ottawa, March, 1914)

M. Alphonse Desjardins, Founder of the Canadian Co-operative Parish Banks System; President and Manager of "La Caisse Populaire de Levis," Levis, Province of Quebec

"CO-OPERATION among Farmers"—such is the title to be found in the programme of this Congress. This implies a much wider field than I would care to approach on account of the limited time at my disposal. Co-operation might, and perhaps I would be justified in saying should be applied to almost all the productive and distributive activities of the farmers. It can be applied in several ways with great benefit to the exploitation of the soil, and the mere mention of the various objects that can be covered by that special form of association would give an idea of the wide range implied in the title referred to. In Europe co-operation is taken advantage of to improve the farming of the land, to the insurance of the buildings, of the animals, the purchase of seeds and of all the necessaries of life under the best possible conditions of price and quality. It is also utilized for the distribution of the wealth produced to the purchasers, that is, the consuming public: and in some countries, like Germany, Austria, France and Italy, co-operative societies are largely organized to provide the necessary capital for the most advantageous exploitation of the farming industry.

As I have had the opportunity for the last twenty-five years to acquire some knowledge both by study and by practical working particularly of the last mentioned co-operative societies, I will confine my remarks to that subject.

The importance of putting at the disposal of agriculture the all-powerful help of capital is recognized by all and there are but few who dare to entertain any doubt as to its usefulness in that special field. Capital is just as necessary to the farmer as it is to the manufacturer and the commercial man. As a matter of fact, the farmer is a manufacturer and a dealer. He produces and sells his products. He, therefore, requires, as well as the manufacturer and the ordinary dealer, the necessary capital to tide him over certain difficult periods that are sure to arise in his calling; he requires capital to improve his land, his buildings, his implements, his stock. He must have capital to enable him to wait for better prices for his products and not to be obliged to put upon the market his products at a season when there is, for one reason or another, abundance of similar products, which brings inevitably a ruinous lowering of prices, which contingency benefits the middleman, not the consumer. For all these purposes, capital is needed.

In the financial organization that prevails now in Canada, can it be said that the farmers have at their disposal an institution having for its sole object to provide them with the necessary credit or capital that their industry requires? I shall not surprise any one, I am sure, in stating that there is none. It may be said that banks do lend sometimes to farmers, but those large institutions have been organized with a view to satisfy the requirements of manufacturing industries and commerce, and never to help financially the farming industry. In a general way it may be contended that to some extent they do harm to that industry by collecting deposits throughout the country through their rural branches, and sending those deposits to the big centres where the main offices are situated, such capital being there utilized for speculative purposes, to finance industries and commerce, not to help the farmers.

Speaking of credit for the farmers a distinction must be borne in mind. There are two sorts of credit: one is called long time credit, that is credit that should be available for improvements on the farm, the complete return of which cannot be expected before many years. There is also another kind of credit, called "short time credit". This one is required by the farmer to tide him over a difficult period, or to enable him to wait for better prices, to buy a horse or a cow or some agricultural implements, or for some other wants of a similar character. Both of these credits are available in most European countries through special societies working among the farming community. In order to shorten my remarks I will limit them to the organization of the short time credit institutions, although the same institutions can, in my mind, be worked out, in due time, to give long time credit as well, when the accumulation of deposits has reached a sufficiently large sum to enable the institution to utilize at least part of such accumulation without real danger. Experience in the European Raiffeisen banks has shown the soundness of that view.

In studying the economic side of the agricultural problem here, I could not help but be struck with the absence of any financial organization to provide the farmers with the necessary credit, and after having studied carefully what had been done in the old world and the peculiar conditions of our own country, I became convinced that credit societies could be advantageously organized in our midst and safely worked with benefit to the farmers. I started the first co-operative and savings society in Levis in 1900, under the name of "La Caisse Populaire" and included the farming community in the immediate neighborhood of that town, in order to make an experiment both among an urban and agricultural population. Later on, after what I considered a complete success, I extended the same system to purely farming communities and everywhere, as I will show later on by quoting a few instances, the success has been as striking as it had been in my own pioneer society.

Some principles have to be rigidly observed to insure the success of such a society.

Here are the leading principles laid down by those who have initiated that credit system in Europe and which I have adopted in introducing the same system in Canada with, however, a very important change that I will mention later on.

It is to be noted that such a society is not an aggregation of mere capital, like the joint stock company, but an association of individuals who put their savings into a common fund and who can borrow from that fund with the approval of the officers appointed to supervise the granting of loans and upon furnishing reliable securities, both moral and material. Being an association of persons, the voting power is based upon the individual, not upon the shares, therefore, the one man one vote system prevails, no matter what number of shares is held.

In the next place, the area within which the society operates must be a very narrow one, not extending beyond, say a parish, a township, or a town, not a large one, so that every member of the society should be known to the other and likely be known by the officers. This insures the safety of the society and of the loans granted.

The capital should be withdrawable upon a short notice, because the individuals who are likely to become members cannot afford, like a capitalist, to immobilize their small savings in unwithdrawable or only transferable shares, like those of a joint stock company or a bank. To adopt the unwithdrawable share capital system would, in a large degree, prevent a great many individuals from joining the society because they would not care, or dare, to invest their small savings in such a society, whilst they would readily join one where the capital is withdrawable upon a short notice, making their holdings available whenever they may happen to want them.

The liability is limited to the amount of the shares subscribed. Here lies the main difference from the European societies of the same type. In Europe the unlimited and joined liability of the shareholders prevails to a very large extent, although the number of the societies limiting the liability of their shareholders is growing yearly, the experiment of Signor Luzzatti in Italy having demonstrated that the unlimited liability system was not required as was believed at the start.

In Canada, I have adopted a still more flexible liability in taking the regime of the New England States Saving Banks, where there is no capital and no financial liability on the part of the founders or promoters of this type of banks. The prosperity of these banks induced me to believe that the same system would prove as successful in Canada if it was applied to those co-operative local credit societies.

The borrowers must be members of the society, and no one is admitted if he is not considered honest and upright. Money is no object and cannot insure the admission of any one who does not possess such moral qualifications.

It goes without saying that all the officers must be residents of the locality where the society is working.

The funds are provided by the savings of the members, for such a society encourages thrift and providence, in fact, its two main objects are to instil thrifty habits and to provide loans for productive purpose. I say advisedly "productive purposes", because the borrower must state for what purpose he borrows, and if the purpose is not considered a good one by the officers, the loan is refused, no matter what the guarantee offered.

This system contemplates putting at the disposal of the laboring and agricultural classes the savings made by those very classes, instead of being collected and thrown by millions into the channel of trade and industry as is done now to the great disadvantage of the humble classes of the population, who are being thereby deprived of a most important part of the benefit of their own savings.

The foregoing gives a general but substantial outline of this new system of banking. Let us see now the results that it has so far achieved in Canada. There are in the Provinces of Quebec and Ontario 139 of such co-operative credit societies. I will not, of course, quote every one of them, nor a large number; I will content myself with a very few examples, believing that this will be sufficient to give a fair idea of the beneficial working of the system.

I will quote first the pioneer society of Levis, which is now in its 14th year of existence. On the 15th of February last its total assets were $268,815, of which $240,778 were loaned out. The total amount loaned out since its inception reached then $1,267,146, and the amount reimbursed $1,026,367. The total number of loans was 6,650. What is more remarkable is the fact that not one cent has yet been lost. The shareholders receive 5 per cent. on their $5.00 share, and 4 per cent. on their deposits. The expenses for thirteen years and two months amounted to the trifling sum of $4,872.00. The reserve funds have now reached a total of $16,200. This society is in a position to take care of all the financial needs of the farming community included in its territorial unit.

St. Maurice, near Three Rivers, in the county of Champlain, with a population of 1,500, is a purely agricultural parish. Its credit society was organized in August, 1909, and on the 31st of January, 1914, its general assets were $49,271, out of which $45,468 were loaned out. The total loans aggregated $135,465. Total expenses, $1,330. Reserve fund, $2,629.

Another instance is that of St. Paul, in the county of Montmagny, a small agricultural parish, with a population of about 1,400.

Its society was organized in June, 1912, and sixteen months afterwards, on the 31st of January, 1914, it had already $16,243 of assets; loaned out, $13,759, and the loans totalled $21,770. All those loans were granted to farmers in the locality.

There are 120 of these co-operative parish banks in the Province of Quebec, and 19 in Ontario, although there is no law in the latter province to foster these societies. In none have I heard that one cent had been lost through bad or doubtful loans.

Quebec has a most liberal law since 1906: this accounts for the expansion of this system in that province. A somewhat similar law should be passed by the Federal Parliament.

In connection with the expansion of this system, I must state that for almost ten years I refused positively to organize such societies elsewhere, before I had made a complete experiment of this system at Levis. The success in Levis having been even more thorough than I ever expected, I began to organize such societies wherever I was invited to do so.

It might not be out of place to add that all has been achieved without one cent of subsidy or help from any government, but through the mere attractiveness of the organization and its beneficial results. That shows what can be done by self-help and association.

In concluding, may I be permitted to add that instead of the un-Christian doctrine of "struggle for life," let us have "union for life", as the foundation stone of the prosperity and grandeur of our agricultural classes.

CANADA'S GREAT EASTERN EXHIBITION AT SHERBROOKE

An Excellent Display of Exhibits of Live Stock, Horses and Garden Produce; Held Sept. 5th to 12th; Weather Unfavorable

THIS year, as in previous years, the farmers of Eastern Canada assembled for friendly competition at Sherbrooke, the centre of "The Townships". The weather-man was not very kindly inclined towards the Sherbrooke fair, and the attendance was considerably affected on this account, especially during the first days of the exhibition week. Otherwise not even the general economic stringency could have prevented an absolute success in all respects. The Directors had done their best, accommodations were good, the prizes were numerous, and the exhibitors had responded very readily to the summons. In fact, the exhibits, with few exceptions, were never better, and the judges were in many cases unable to finish their work on one day.

On the whole the animal exhibit drew perhaps more attention than the others, and quite naturally so. Everything is done to make this part of the exhibition a dominant feature, whereas comparatively scanty arrangements are made for the demonstration of crop production. The educational exhibits from the Central Experimental Farm, at Ottawa, from Macdonald College, Ste-Anne de Bellevue, and from the Agricultural Institute at Oka, partly demonstrating different methods in field husbandry, aroused a good deal of interest and were well worth the general admiration bestowed upon them. But this ought, only to be a beginning. After all, the foundation of agriculture is the soil and the crops, and there is little use in importing and breeding animals of high quality unless we are able to feed them conveniently and economically. Hitherto we Canadians have paid far too little attention to the crop-producing end of farming, and it will be necessary to make a change in this respect, if Canada is going to occupy the high place among agricultural countries for which she is pre-eminently fitted through her splendid resources and varying conditions.

Lining up before the big Cattle Parade. Sherbrooke Exhib. 1914.

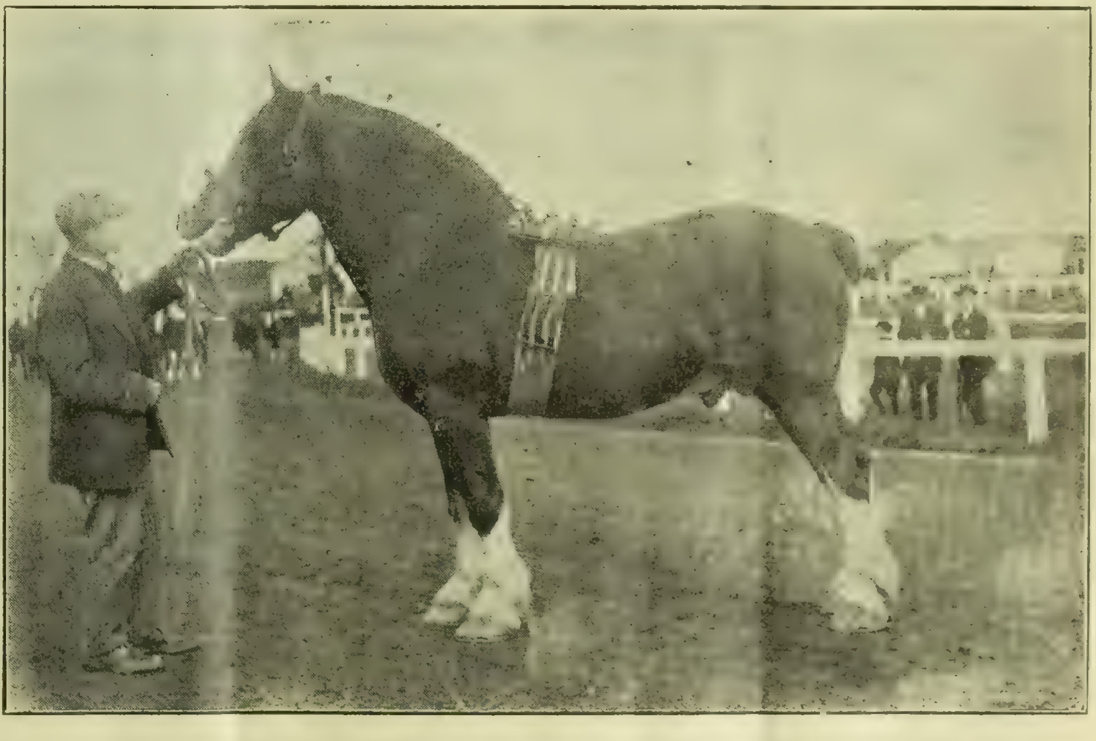
CATTLE

We interviewed Prof. H. Barton, Macdonald College, as well as Mr. E. S. Archibald, Dominion Animal Husbandman, who, among others, acted as judges in different classes. Each agreed that the cattle exhibit was both in numbers and quality one of the best Sherbrooke has ever had. The Jerseys, for instance, have never before been shown to such advantage in Sherbrooke as this year.

The majority of the leading breeders of beef and dairy cattle in the Province of Quebec were well represented, and good herds of different breeds from Ontario and New Brunswick were also shown. Several new herds from the Province made their first appearance at a large fair this year, and their owners had no cause whatever to repent their bravery, the county exhibitions having afforded them good training and good judgment in showing.

Shorthorns and Ayrshires made their usual strong appearance in the Sherbrooke ring, and both Holsteins and Jerseys had perhaps their most excellent year. Aberdeen Angus and Herefords were there in smaller numbers, but were generally of good quality. French Canadians, with one brilliant exception, were not shown to their best advantage. Even though we decidedly disapprove of all methods that might be considered as "fixing" the animals, we strongly believe in "fitting" them for exhibition. The Cap Rouge Experimental Station gave a good object lesson to the breeders of French Canadian cattle how animals should be fitted and shown, and we feel sure that the breeders will benefit from this excellent demonstration.

The two Shorthorn fanciers, F. R. Cromwell, Cookshire, and J. M. Parker, Lennoxville, both had their herds in splendid form and, of course, got their rewards. T. D. Elliot from Richmond also got his share of the coveted money. In Herefords B. A. Alger, Eaton, and A. Hunter, captured most of the prizes. In the Aberdeen Angus class J. A. McLeod from Plainsville, Ont., was by far the strongest exhibitor. Excellent Ayrshires were shown by James Boden and Sons, Danville; D. T. Ness, Howick; Senator Owens, Montebello; A. Phaneuf, St. Norbert; J. St. Marie, Compton, and F. Montgommery, Phillipsburg. The strongest exhibitors of Holsteins were Harding Bros., New Brunswick; Neil Sangster, Ormstown; J. J. Alexander, St. Louis, and J. L. Riches, Sherbrooke.



"Sir Spencer", first and champion in aged class. Property of Ness Bros. Howick, Que. Sherbrooke Exhib. 1914.

I Prize. Two year old Hampshire ewe, exhibited by A. W. Oughtred, Marbleton, Que. Sherbrooke Exhib. 1914.

In the Jersey classes the Cowansville herd from C. R. Ruiter & Sons made perhaps the best display, but the herds from W. Martin, Warden, and from Edwards & Alexander, Ayer's Cliff, also showed very good individuals. French Canadians were exhibited by Arsene Denis, St. Norbert; P. Sylvestre and Joseph Coulombe, St. Norbert.

The Provincial Government had presented two silver cups for the best display of cattle. They were conferred upon F. R. Cromwell for Shorthorns, and upon James Boden & Sons for Ayrshires.

The cattle parade on Wednesday, Sept. the 9th, proved as attractive and interesting as in previous years, and this feature, when well engineered, is a splendid one for both breeders and spectators, since it affords the first an opportunity to display their animals and gives the latter a chance to see and compare the different breeds to advantage. The difficulty in getting hands to lead the animals in the ring which was reported to have been encountered by some exhibitors might have been easily overcome if they had previously trained their animals to walk abreast, coupled to each other's halters. Two men can easily handle five cows that way; and it certainly gives a nice impression to see, for instance, an aged bull leading, followed by five aged cows in a string, and these again succeeded by a young bull preceding five heifers coupled to each other. This method only requires six men whereas the old method, where each man only leads one animal, in this case necessitates twelve men.

HORSES

This year's showing in horses was well up to former standards. Both light and heavy classes were well-filled with horses of good quality, a number of the winners and championship individuals already having good show-yard records in this country. Both Clydesdales and Percherons were well represented, Belgians making a smaller exhibit and not the equal in quality with either Percherons or Clydes. Robert Ness & Son, Howick, had a good string of Clydes and captured the bulk of the honours, carrying off both male and female championships. "Sir Spencer", seemed as fresh as ever and had little difficulty in landing the championship award. Dr. Eachran from Ormstown was a new exhibitor for Sherbrooke and added materially to the heavy horse show. Wm. Nussey, Howick, was also a strong exhibitor and with his aged stallion won the championship in the Canadian-bred class. J. E. Arnold of Grenville, Que., was the leading exhibitor in Percherons and brought out a number of well-fitted, good individuals.

I Prize. Yearling Leicester ewe from flock of H. S. N. Allan, Newcastle, Ont. Sherbrooke Exhib. 1914.

Light horses in Sherbrooke are always popular, and the local exhibitors insure full classes and keen competition. This year was no exception, all of the classes producing creditable winners.

SHEEP AND SWINE

The display of sheep was particularly strong in the Leicester and Cotswold classes, but the Hampshires and other breeds also made a good showing. Though the exhibit of flocks from Quebec was reinforced by some of the best from Ontario, it was quite evident that we have some splendid foundation in our Province for future progress along the sheep-breeding line. This was further brought home through a demonstration flock of Cheviots sent down by Macdonald College and including representatives from the College extension flocks at the farms of W. J. Parnell, Lennoxville, and E. N. Chaddock, Cookshire. These sheep showed good uniformity and splendid quality.

I Prize. Yorkshire son under one year, exh, by Mc Cullough Bros. Sutton, Que. Sherbrooke Exh. 1914

I Prize. Berkshire Born from herd of John Harvey, Frelighsburg. This boar has won the Dominion championship four years in succession and captured four first prizes this fall.—Sherbrooke Ex. 1914.

Medium wools were well represented. J. W. Oughtred, Marbleton, carried off a good share of the money in Hampshires, with Lyster Bros., Drummond Co., as good seconds. J. Kelsey, Woodville, practically swept the board in Shropshires. The Southdowns lacked somewhat in number, but this was made up for by splendid quality of the exhibited animals. Mr. Ayre, Bowmanville, was leading exhibitor in this class. There was good competition in the Oxfordshire Downs, although it should be mentioned that some of the sheep were not so well fitted as they might have been. Guy Carr, Cookshire, P. Sylvestre, Arsene Denis, St. Norbert, and Senator Owens, Montebello, all gave good displays in the lamb class. In Cheviots, Ayre Bros., had the strongest exhibit.

The long wools were fully as well represented as the medium and short wools. Allan Bros., Newcastle, Ont. were out with a very strong flock of Leicesters, one of which is shown in the accompanying illustration. They were also very well represented in Cotswolds.

We have seen much larger numbers of swine at Sherbrooke than were exhibited this year. Several of the best herds in the Province were considerably decimated last year by hog cholera. One of the leading breeders of Berkshires, John Harvey, Frelighsburg, thus lost almost his entire herd. Fortunately a few of the best animals were preserved, among others the boar who has captured the Dominion Championship for four years. Yorkshires and Chester Whites were well represented. In the Yorkshire class McCullough Bros., Sutton, took a big share of the coveted prizes, Marshall W. Millar, Brome Centre, was the most successful exhibitor of Chester Whites. The Tamworth class as a whole could not compare with the other breeds.

POULTRY

It was quite evident that the Barred Rock is the most favoured breed in the Province, although only comparatively few really first class birds were shown. Rhode Island Reds and Leghorns were decidedly better than in previous years, Dark Cornish were also strong, and Bantams had a good turn out. Comparatively speaking, the Wyandottes were not numerous, but the quality was decidedly above average. Even the non-professional could not help but notice that a good many of the Quebec birds did not show the quality which might be wished for, and we heard one of the judges say, that unless the Quebec poultry breeders make a

Part of the Macdonald College Exhibit, arranged by the Poultry Department. Sherbrooke Exhib. 1914.

Part of the Macdonald College exhibit, arranged by the Cereal Husbandry Department, at Sherbrooke Exhib. 1914.

strong effort to improve their stock, it will take a long time before their birds can compare with those of the breeders of Ontario.

A school exhibit, arranged by the Poultry Department of Macdonald College, was shown in a special tent beside the ordinary Poultry Building. It included 303 birds, all of Macdonald Plymouth Rock stock, for which the eggs had been distributed last spring to the pupils of the Lennoxville Academy and to rural schools in the vicinity of Sherbrooke. The majority of the pullets and cockerels were well developed and the awarding of prizes, according to the judge, was a very difficult task. In this exhibit both the parents, the children and the public in general took a great interest.

GARDEN AND FIELD CROPS

The exhibits of garden produce, flowers, vegetables and fruit by far excelled those of field crops both in numbers and quality. There was an abundance of lovely flowers in pots and glasses; vegetables would stand comparison with any exhibit of a similar kind; and one of the judges, a man of wide experience, pronounced the collection of vegetables, exhibited and arranged by Miss Parker, Willowdale, Lennoxville, to be the best he had ever seen. One might remark that field and garden pumpkins should not be entered in the same class. A change in the entry list would be desirable in this respect.

Fields crops were poorly represented with the exception of corn, roots and potatoes. In some cases the grain was even miserable, and if one were to judge from these samples and did not know better, one might conclude that the Eastern Townships were unfit for grain growing. It is entirely out of place that oats, almost ranking with "Western Oats", are allowed to win simply on account of lacking competition. Good silage corn was shown, although some of the samples were rather immature. In regard to roots, the objection might be made that the entry list only included one class for mangels. It is for instance scarcely fair to compare globe-shaped mangels with those belonging to the intermediate or to the long mammoth type.

EDUCATIONAL EXHIBITS

As previously mentioned the Central Experimental Farm at Ottawa, Macdonald College and the Agricultural Institute at Oka had arranged some very instructive exhibits which all drew well-deserved attention. We deplore very highly that the Oka Institute, through no fault of the Institute authorities, did not obtain all its requisites in time, as we feel sure that among other things their fruit exhibit, which was to be arranged by Father Leopold, would have been just as attractive and instructive as usual. Macdonald College partook for the first time at the Sherbrooke exhibition as a unit, and the various departments had done their best to make the display as interesting as possible. The visiting farmers also showed their appreciation in more than one way, not least by asking information on different points from the attending members of the staff.

All in all the Sherbrooke Exhibition of 1914 may be considered a decided success. Directors and Exhibitors have a whole year to prepare for the next event on the beautifully situated fair grounds, and we wish them all good success.

PAUL A. BOVING

COMPTON COUNTY SCHOOL FAIR

Cookshire Sept. 18th

THE first Compton County School Fair was a marked success. The weather although threatening in the morning cleared up nicely in the afternoon. By eleven in the morning nearly all the exhibits were in and a large crowd had assembled, many partaking of a picnic dinner on the grounds.

The exhibits were large and good, about 200 chickens were shown, nearly 50 exhibits of potatoes and many pretty bouquets of flowers. These were all from eggs and seed distributed from Macdonald College. The potato show was exceptionally good, and most of the children made a wise selection of material for their exhibits. Mr. Jull, who judged the poultry, said they were the most uniformly grown lot that he had seen at any school fair in the Province. Several collections of vegetables were shown, of which one or two merited special attention. The weed collections, while not numerous, were excellent for school children.

In the Department devoted to the school work, which was in charge of Inspector Hunter, the exhibit was not as large as might have been hoped for, especially from the rural schools. The pupils of Cookshire Academy made an excellent showing in this line.

In the sewing, for which prizes were offered by the Cookshire Women's Club, some excellent work was shown. In this class also the exhibits were rather few.

After the completion of the judging a short program was carried out, consisting of speeches by Mr. A. C. Gorham, Macdonald College Horticultural Department, on "Selection of Potatoes", Mr. Jull on "Barred Plymouth Rock Chickens, Inspector Hunter on "Agricultural Education in Rural Schools", and F. R. Cromwell, John French and Douglas Taylor of Cookshire Academy gave recitations which were much appreciated.

About 500 people visited the fair, consisting in the main of school children, their parents and friends. Work in Agriculture in the Rural schools, of which the school fair is a part, is proving one of the best ways of interesting children in farming. This work should certainly be carried forward in earnest, as it is undoubtedly the best way to build up a strong, intelligent farming community. The work is only in its infancy as yet, but it is hoped that Compton County will advance rapidly.

Following is a list of the prize winners:—

Corn.—Best Kept Plot. 1. Grover Hodgman, 2. Elmer Drake, 3. Beryl Butler, 4. Robert Mayhew, 5. Archie W. French.

The corn will be shown at the seed fair in January as it was not ripe enough at this time.

Potatoes.—Best Kept Plot. 1. Freddie Frizzle, 2. Leonard McGilton, 3. Ruby French, 4. James Ward, 5. Gordon Mayhew, 6. Alma Quint, 7. Arthur Farnsworth, 8. Phyllis Bridgette, 9. Clayton Muncaster, 10. Ivan Herring.

Best Peck, 1. Phyllis Bridgette, 2. Freddie Frizzle, 3. Leon Coates, 4. Ivan Herring, 5. J. C. Williams, 6. Ralph Bennett, 7. Alex Hodgman, 8. Gerald Williams, 9. Percy Carley, 10. Percy Jackson.

Best Twelve, 1. Gladys Rudd, 2. Freddie Frizzle, 3. Gerald Williams, 4. Douglas McAllister, 5. Evan Herring.

Flowers.—Best Kept Plot. 1. Alice Rudd, 2 Margaret Kirby, 3. Hilda Wright, 4. Gretchen Riddell, 5. Marion Robertson, 6. Kathleen Ward, 7. Mildred Gillis, 8. Frida Cromwell, 9. Kathleen Ashe, 10. Margaret Mayhew.

Bouquet Sweet Beas, 1. Rita French, 2. Margaret Kirby, 3. Warion Cromwell, 4. Hilda Wright, 5. Freda Cromwell.

Bouquet Phlox, 1. Gretchen Riddell, 2. Kathleen Ward, 3. Hilda Wright, 4. Grace Miller, 5. Alice Rudd.

Best 12 Asters, 1. Margaret Mayhew, 2. Alice Rudd, 3. Marion Cromwell, 4. Hilda Wright, 5. Rita French.

Chickens. Best and Largest Lot. 1. Ernest Truax, 2. Percy Hough, 3. Thomas Majury, 4. Naomi Gilman, 5. Edna McAllister, 6. Kathleen Scott, 7. Oren Farnsworth, 8. Florence French.

Best Five, 1. Helen Miller, 2. Rupert Mayhew, 3. Kathleen Forrest, 4. Dorcas Thompson, 5. Norah Warren, 6. Sadie Matthew, 7. Grace Murray, 8. Luvia Jackson.

Best Trio, 1. Alex Taylor, 2. Rupert Mayhew, 3. Doris Bridgette, 4. Irene Chaddock, 5. Arthur Williams, 6. Grace Cromwell, 7. Earnest Gadley, 8. Clifford Smith.

Best Pair, 1. Florence French, 2. Oren Farnsworth, 3. Clifford Smith, 4. Kathleen Scott, 5. Norah Warren, 6. Hazel Woolley, 7. Frank Woolley, 8. Dorcas Thompson.

Best Cockerel, 1. Thos. Majury, 2. Rupert Mayhew, 3. Kathleen Scott, 4. Norah Warren, 5. Naomi Gilman, 6. Kathleen Forrest, 7. Alex Taylor, 8. Arthur Williams.

Best Pullet, 1. Oren Farnsworth, 2. Clifford Smith, 3. Irene Chaddock, 4. Luvia Jackson, 5. Edna McAllister, 6. Isabel Shaerman, 7. Ernest Gadley, 8. Kathleen Scott.

Collection of Vegetables. 1. Norah Warren, 2. Earnest Truax, 3. John Durton, 4. Frank Wooley, 5. Archie French, 6. Grace Cromwell.

Alexander Apples. 1. Earnest Cork. 2. Grover Hodgman.

Fameuse Apples. 1. Grover Hodgman.

Weed Collection. 1. Margaret Kirby. 2. Leonard McGilton, 3. Gladys Rudd, 4. Alberta Westgate.

Weed Seeds. 1. Winifred Kirby. 2. John French. 3. Gladys Rudd.

Pumpkin Pie. 1. Grace Cromwell. 2. Margaret Kirby, 3. Elisabeth Boy, 4. Jessie Truax.

Roils. 1. Margaret Kirby. 2. Elizabeth Boy.

AGRICULTURAL INSTRUCTION AT THE PROVINCIAL EXHIBITION

Departmental Encouragement of all Branches of Agriculture

THE Hon. J. E. Caron, Minister of Agriculture for the Province of Quebec, makes it a rule to utilize to the fullest possible extent the opportunities afforded by the Provincial Exhibition at Quebec, to offer encouragement to the agricultural interests of the Province.

For the last three years he has entrusted to one of the officials of his Department, Mr. A. G. Lambert, the duty of organizing the agricultural exhibits at the Fair, and the farmers of the Province are indebted to the Minister for his wise choice of a tactful and resourceful agent for the accomplishment of this important task. From the columns of *L'Evenement* we abridge a report of some of the exhibits of chief importance in relation to agricultural instruction and advancement.

As one enters the exhibition grounds and looks west, one catches sight of a very pretty building, artistic in its lines and tasteful in its decorations, a real little jewel of economy and good taste. This building is, so to speak, the farmer's reception hall. Not only for the building itself but also for the numerous features of the exhibit congratulations are due to Mr. Lambert and to the Provincial Department of Agriculture.

AGRICULTURAL PRODUCTS

First we may mention the exhibits of fruit, vegetables, maple syrup and sugar, bacon and ham, which the Department installed in the eastern division of the Industrial Hall. Here were to be seen fruits from the Demonstration Orchards at Rougemont, St. Hilaire and Abbotsford in the County of Rouville, from St. Joseph du Lac in the County of Two Mountains and from Havelock in the County of Huntingdon,

Here also were exhibits of fruits by the Cooperative Fruit Grower's Association and by the Horticultural and Fruit Growing Societies of Montmorency and Bellechasse. From the Oka Agricultural Institute and the School of Agriculture of Ste. Anne de la Pocatiere there were exhibits of bacon and ham. In the same part of the building were exhibits of vegetables grown in the gardens of the County of Quebec. Pure honey was shown by the Quebec Bee-Keepers' Association. The exhibit of syrup and maple sugar was made partly by the Pure Maple Syrup and Sugar Cooperative Association of Waterloo and partly by the sugar schools established last season by the Honorable Minister of Agriculture. All these exhibits were artistically installed and presented a novel and attractive appearance. Of special beauty was the Departmental exhibit of apples arranged to represent the arms of the Province. This was a veritable masterpiece of decorative art. The Experimental Farms exhibit also attracted many visitors. The Kamouraska Cooperative Society exhibited a novel invention for hermetically sealing fruit jars. This is the first invention of the kind to be shown in Canada and the Minister of Agriculture has taken an option upon the patent so as to have absolute control over it.

THE FARMER'S PARADISE

In the north wing of the hall was a richly decorated space which the farmers visited with the greatest pleasure, inasmuch as it was specially reserved for them. The Department spared no pains to make this little "farmer's paradise" attractive with draperies, tapestries and ornaments, most beautiful and most artistically disposed. Officials of the Department were stationed here to give information to visitors. Messrs. Solyme Roy and Abel Raymond and others were prepared to answer questions on fruit growing, and at the Hon. Mr. Caron's suggestion, the Hon. Mr. Allard had placed here an exhibit of the Forest Service, bearing the inscription of the Berthierville Nursery, where information was given regarding destructive insects and the most efficacious means of combatting them.

A useful Turnip Harvester. If the farmer can make the operation of pulling turnips less laborious he makes farming not only more pleasant but also more profitable.

POULTRY KEEPING

For some years, as the Poultry Manager of the Oka Agricultural Institute justly remarks in his Bulletin No. 4. "Ten years of practice and experiment in the Poultry Yard", the Department of Agriculture has devoted special attention to the poultry-keeping industry and its efforts have not been in vain. Progress is manifest in nearly all districts of the Province. Everywhere now, the Manager tells us, special houses are built for poultry and the antiquated and unsanitary practice of keeping fowls, geese and ducks in the stables with horses and cattle has been abandoned. Feeding methods have been improved and artificial hatching and brooding are becoming more popular year after year.

Judging by the numerous and incessant inquiries which that department received, one must conclude that the cause of the insufficient supply of table fowl and eggs is simply want of technical knowledge on the part of poultry breeders. It is to supply this want that the Department has organized the educational campaign of which Rev. Brother Liguori of the Oka Agricultural Institute has charge and the success of which must be a source of satisfaction both to the Department and to its representative.

Twelve little poultry buildings, such as could be built by any farmer, were installed on the Exhibition grounds. Incubators and hovers made in the Province were in operation and chickens were being hatched every day. Two types of cold poultry houses were on exhibition; one ventilated by means of cotton curtains, the other with a modified Rutherford system of ventilation. Pullets and ducklings hatched in April were on exhibition and had already attained mature dimensions. Some of the Plymouth Rock pullets had even begun to lay. The advantages of early hatching were strikingly illustrated in these birds.

FATTENING AND CAPONIZING

In the last few years, "Quebec Milk-Fed Chickens" have attained a great renown on railway dining cars and elsewhere. At the exhibition, instruction was given in the process of cage-fattening, a process which assures the farmer a net profit of twenty-five cents per fowl in return for eighteen days of attention to the cages. Twice a day demonstrations in killing and packing were made in a tent. In one minute and a half, a student of the Oka Institute would bleed and pluck any fowl. It was a matter of agreeable surprise to many to learn that the plucking could be done quickly and thoroughly without the old-fashioned preliminary scalding.

Demonstrations in caponizing were also given. A young agricultural student, scarcely fifteen years old, successfully caponized as many as twenty-eight fowls a day. The simplicity of the process was a revelation to many. Quebec has taken an advanced position among the Provinces in the production of capons and a representative of a large Montreal house who was present at the fair announced that he was ready to take capons by the thousands at twenty-five cents a pound.

800 CHICKENS UNDER ONE HEN

This hen, it is scarcely necessary to explain, was artificial. It took the shape of a coal-oil stove in a building fifteen by thirty in size. The Minister of Agriculture has bought half a dozen of these brooders and installed them in different places in the Province, notably at Oka, and the experience with them has been so satisfactory that a manufacturing house contemplates putting a similar outfit upon the market for next spring.

COOPERATIVE INCUBATION

The Department has also bought half a dozen charcoal-heated incubators with a minimum capacity of twelve hundred eggs. These incubators which are now made to a capacity of three thousand eggs are designed for cooperative incubation. Each breeder rents a drawer of six-dozen capacity, brings his eggs to the incubator, which may be stationed at a creamery and calls for the chickens three weeks later. Most of the chickens on exhibition were hatched in these large machines.

The general exhibit of poultry in the poultry house comprised over 2500 birds, representing all breeds. Both the size of the exhibit and the number of visitors it attracted are significant of the interest taken in poultry culture in the Province.

APICULTURE

A complete outfit for bee-keeping was exhibited and instruction was given in this department of apiculture by Mr. Victor Chercuite of Beauport, Secretary of the Quebec Bee-Keepers' Association.

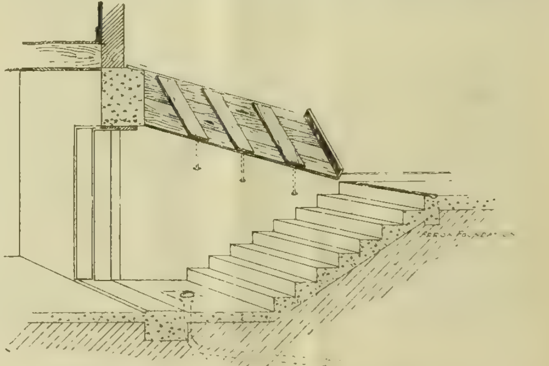
CONCRETE CELLAR STEPS AND HATCHWAY

Construction of permanent steps and water-tight walls

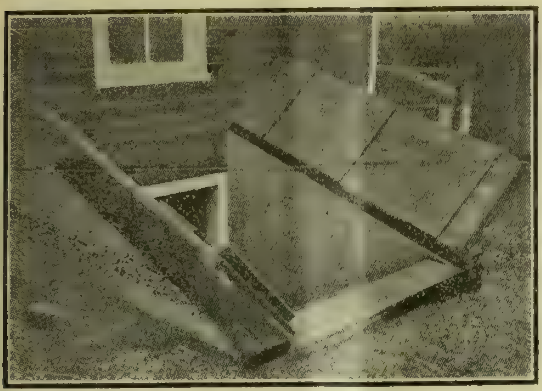
A damp cellar under a dwelling is frequently the unsuspected cause of many a case of sickness. Often this dampness is the fault of a poorly built entrance-way. If water gains access by means of leaky hatchway walls, the cellar becomes unsanitary and the health of the entire family is endangered. This peril can be dispelled by making the walls and steps of concrete.

The methods of building hatchways for either new or old cellars are very similar. With an allowance for a three-foot landing at the bottom of the stairs, excavate the opening to the width of steps desired plus one foot. This extra width is for a six-inch thickness of concrete wall on each side. The steps themselves have a rise of six and a tread of nine inches. Beneath the steps proper is a four-inch thickness of concrete. Therefore provide for thickness in sloping the ground upward from the landing to the top of the stairs. Extend the trenches for the side and end walls one foot below the concrete of the steps. As forms choose two 1 by 12-inch boards and notch them as though they were to be used as "horses" to support wooden steps of the same dimensions as those of concrete. Place the notched edges down with the ends fixed at the top and bottom of the stairs. To mold the rise of the concrete steps, use 1 by 6-inch boards 3 feet 10 inches long, which are secured to the forms by means of nails and wooden cleats.

With the forms firmly fixed in position, fill the mold for the bottom step, and the space back of



PLAN OF CONCRETE STAIRWAY



CONCRETE CELLAR HATCHWAY

it, with concrete proportioned 1 bag of Portland cement to 2 cubic feet of sand to 4 cubic feet of crushed rock. If bank gravel is used, mix the concrete 1 part cement to 4 parts gravel. Bring the concrete in each step to the top of the riser and finish the surface with merely a wooden float. Continue the work upward until all the steps are finished. At the top of the stairs tie the apron foundation to the side walls by means of old iron rods imbedded in the concrete and extending around the corners. This will prevent possible heaving and cracking by frost.

The side forms of the six inch walls are then erected and are thoroughly cross-braced against each other. For these forms use 1-inch siding on 2 by 4-inch studding spaced two feet apart. The walls can be carried to any height desired so as to give the cellar doors sufficient slope for shedding rain-water. Above ground line, outside forms must be provided. Fill the walls with concrete mushy wet. Before the concrete sets, bolts are placed (heads down and washered) in the top of the side walls for holding the wooden sills to which the cellar doors are hinged. After two to four days the forms can be removed. Connect up the drain in the landing and lay the landing floor.

The eight cellar steps of the hatchway shown in the plan have a tread of nine inches, a rise of six inches and a length of four feet. The clear height of the door-way in the cellar wall is six feet six inches. The landing at the foot of the steps is three by four feet and has a four-inch concrete floor. This same thickness of concrete lies under the steps proper. The side walls were built as described above. For this improvement there were required the following quantities of materials.

Bill of Materials

Crushed Rock, ...	2 1-2 cubic yards
Sand, ...	1 1-4 cubic yards
Portland cement, ...	12 bags

For improving old cellar hatchways it is frequently necessary to fill with earth and gravel so as to provide the earthen slope for the concrete steps. Such filling must be thoroughly tamped into place and should be water-soaked and allowed to settle before the steps are built.

Concrete steps, unlike other kinds, become stronger with age. They are perfectly safe under the heaviest of loads. Moreover, besides being water-tight, they keep out rats, mice and other obnoxious vermin.

HANDLING SILAGE.

BULLETIN No. 145, entitled "Handling Silage", has just been issued by the Nebraska. Agricultural Experiment Station. This bulletin has been prepared and issued with the hope of aiding farmers in selecting their silage handling machinery, and in aiding them in reducing the cost of handling their silage, both before it is put into the silo and when it is being removed.

The first part of the bulletin is devoted to discussing the different kinds of equipment used for cutting corn, hauling it, and putting it into the silo, while a large part of the space is devoted to methods of removing silage from the silos and putting it into the feed troughs. A table has been compiled which occupies the last part of the bulletin and shows what the cost of silage is in Nebraska and the cost of the various operations.

It is shown that it costs $1.50 per acre to cut corn with hand knives, $1.18 with the sled harvester, and $1.52 with corn binders.

The investigations carried on by the authors of this bulletin show that two men will hand cut corn up to one man on the wagon more economically than either one or three, and that if a man is careless with his loading, it will require twice the time to unload that it will require if the corn is placed on the wagon according to the directions furnished. The bulletin also shows that it costs $3.37 per acre to haul the green corn 140 rods.

Drag carriers, cutters, and blower cutters are discussed and tables furnished showing the horse power required for each.

Several devices for hoisting silage from pit silos are illustrated and a few for taking the silage from bank or above-ground silos to the feed troughs. Some of these devices are rearranged plans furnished by farmers; others are devised by the authors; while others are those in use on some Nebraska farms.

LIFTING WATER WITH A SIPHON

Editor, Journal of Agriculture.

A stream runs through my farm and the water is about 4 ft. below the bank. Can I lift this water to a tank on the bank by means of a siphon. If so, what size siphon do you advise?

R. W. P. Shefford.

Ans. You cannot use a siphon in this case. A siphon can be used only when the point of discharge it at a lower level than the point at which the water enters the siphon. We advise you to put in a small self—regulating wind mill witg pump and tank.

C. J. LYNDE

LIFTING WATER WITH A RAM

Editor, Journal of Agriculture.

I have a spring which flows into my cellar. It gives about 300 gallons of water in 24 hours. It flows into a tank at a height of 3 feet above the cellar floor. Could I use a hydraulic ram to lift part of this water into a tank placed in the attic above my kitchen? The total lift will be about 20 feet.

W. P. Rouville.

Ans. You cannot use a ram to lift this water. The flow of water is not large enough. The whole flow for 24 hours would keep a small ram running for only about one hour. We advise you to put in a cistern force pump and lift your water by hand. It would be better still to lift the water by some form of power such as wind mill or small gasoline engine.

C. J. LYNDE.

KEEPING SURFACE-WATER OUT OF DRIVEN WELL

Editor, Journal of Agriculture.—

I have a 5½ in. bored well which is about 20 ft. deep. The iron casing goes down to the rock which is at a depth of 6 ft. The pipe enters the rock and was driven in to make a tight fit. In the recent heavy rains surface water entered the well and made it unfit for drinking. How can I improve this?

A. W. R. Compton.

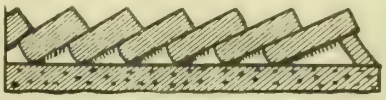
Ans. We advise you to dig down to the rock around your pipe and put a fairly heavy layer of concrete around the pipe at the point it enters the rock. We believe this will keep out the surface water. It is just possible, of course, that the water is entering through crevices in the rock. In this case it is difficult to keep it out. We advise you then to have your pump suction pipe extend down to within one foot of the bottom of the well. The water you get then will be from very near the bottom where it is purest.

C. J. LYNDE.

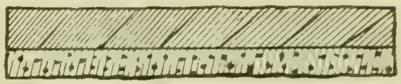
PLOUGHING A NEGLECTED ART

Advantages of Taking Special Care with Fundamental Farming Operation

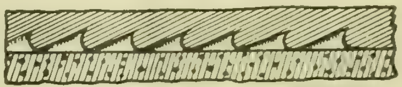
THE art of ploughing, if not lost, has certainly been much neglected during recent years and very few of the younger generation of farmers have really acquired it. In travelling through the country one sees repeated evidences of the lack of interest in this very important branch of tillage operations. Ploughing, as the first and heaviest operation in preparing the soil to receive the seed, should receive particular attention.



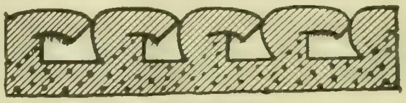
GOOD PLOUGHING



GOOD PLOUGHING PACKED AND WELL WORKED



GOOD PLOUGHING WORKED DOWN BUT UNPACKED



POOR PLOUGHING

Many attribue the present-day lack of interest in ploughing to the advent of the two-furrow and machine plough. In using two-furrow or machine ploughs, it is necessary first to acquaint oneself with the workings and mechanism of the plough, to be thoroughly familiar with it when in operation; little or no difficulty will then be experienced in obtaining satisfactory results. A plough suitable to the soil should be chosen. If the soil is loamy, and requires to be turned flat, choose a plough with sufficient width of share, a board with ample turning capacity, a beam high enough to permit the use of the jointer when turning under green or coarse manure, and sufficient length of handles to enable the ploughman to control it with ease. If the soil is heavy and inclined to cement, use a narrow plough—one that will set the soil up, give a good harrow edge, and have sufficient press to the board to place the furrow over so that it will not fall back. In using either a single or two-furrow plough, care should be taken to turn over the whole furrow and to leave no part unploughed. Get away from the cut-and-cover plan. Teach the boys that anything worth doing is worth doing well, especially ploughing. The old adage that more grain grows on crooked furrows than on straight ones is a poor incentive, and is not helpful in building up a reputation as a model farmer. Plough the back field as carefully as the field adjoining the road, and see that all fields are ploughed in such a way as to attract attention by their neatness. It is cheap and efficient advertising. Good ploughing pays; if a fair crop can be grown on a field which has been poorly ploughed, a better crop can be grown on a well ploughed field. —*F. C. N. in Conservation.*

LIVE STOCK

AUCTION SALE OF BREEDING STOCK

By the "General Stock Breeders' Association of the Province of Quebec", under the patronage and with the help of the Department of Agriculture of Quebec

Quebec, 15th August, 1914.

Sir,

THERE is to be a sale of registered bulls, swine and sheep at Montreal, at the East End Cattle Market (corner of Frontenac and Iberville Streets), at 10 a. m., on Thursday, 8th of October, 1914, and at Quebec, at the Exhibition grounds, at 10 a. m., on Wednesday, 14th October, 1914. The sale will be made for cash, except for Farmers' Clubs and Agricultural Societies, which will be entitled to the following delays:—Clubs buying for $50.00 or less will pay on the first of November, 1915, and any Clubs buying for more than $50.00 will pay one half the amount of the purchase on the first of November, 1915, and the other half one year later. However, a Club in buying or borrowing cannot contract debts for any higher amount than $250.00. Agricultural Societies buying for $300.00 will pay on the first of November, 1915, and those buying for a larger amount will pay one half on the first of November, 1915, and the other half one year after, without interest, but with interest after the payments are due.

This sale will be made subject to the following conditions: 1. The purchaser will be bound to keep the animals bought for breeding purposes in the province of Quebec for two years; 2. to keep and feed these animals with care; 3. to sign a contract relative to the sale with the department of Agriculture. The latter may retain the price out of the grants to be paid to the Clubs or Agricultural Societies.

The Honourable Minister of Agriculture hopes that the Farmers' Clubs and the Agricultural Societies will take advantage of this sale in order to purchase choice breeding animals.

These animals have been selected by experts from the herds of the best breeders. The bulls offered for sale will be of the following breeds: Canadian, Ayrshire and Holstein. The sheep offered for sale will be of the following breeds: Leicester, Cotswold, Lincoln, Shropshire, Hampshire and Oxford. The breeds of the swine offered for sale will be Yorkshire, Berkshire, Chester, Tamworth and Duroc-Jersey.

The bulls shall have been submitted to the "Tuberculin test".

You will be good enough, if possible, to call a meeting of the directors of the Association of which you are a member and submit this circular to them.

The person authorized to buy should bring a copy of the resolution giving him the power to do so.

Yours truly,

G.-A. GIGAULT,

Deputy Minister of Agriculture

Nota.—The way to the East End Cattle Market,

AGRICULTURE IN THE RURAL SCHOOLS OF ONTARIO

Second Article

TRUE education is supposed to enable persons receiving its benefits to be able to do at least two important things, the latter being the result of the first, but both closely related. These might be stated as follows; first, the ability to perceive the "why and wherefore" of the daily problems which confront them, and secondly, having intelligently perceived the situation, to perform the same in an efficient manner.

Does the education which our country children receive to-day enable them to solve the problems of agricultural life in an efficient way after they have left school and taken up farming as a means of livelihood?

It is certain that we cannot answer this question in the affirmative. To-day our rural scholars study a course of study, which from the beginning of school life until the end, shows very little direct bearing upon the work they ought naturally to take up after they leave school. Our course of study is practically the same for both country and city pupil, and unfortunately for the former, it was made to suit the city pupil, whose aim is nearly always to enter professional life, a calling which only about 5% of our rural scholars wish to pursue.

This leaves 95% of them studying a professional course, or one in which that tendency is present. The inefficiency of such a system cannot help but be evident to us all. We are well aware of the complexity of Agriculture and its intimate relation to the sciences, and if we are to have efficient farmers, they must necessarily receive the instruction which will make them such.

Happily we are not the first to see such a great defect in our otherwise efficient school system, and in many parts of the Dominion a great deal has been, and is being done to bring about changes which should be of great benefit to our rural schools.

Among the pioneers of this movement stands Ontario, which, considering the wastness of the field, and the innumerable difficulties which always accompany such a reform, has already done much to introduce and maintain the study of Agriculture in the elementary schools.

In that Province there are to-day over three hundred schools taking up the study of Agriculture, most of them according to the rules of the Education Department, which in co-operation with the Agricultural authorities lays down the course to be studied and gives substantial grants to those schools which follow their regulations.

The teachers of that province are enabled to take a short but practical course in Agriculture at the Ontario Agricultural College. This course lasts ten weeks and may be taken in one session or divided into two summer courses of five weeks each. The studies taken up are made as suitable as possible to the requirements of the farming community of Ontario.

The lecturers are experienced as regards these needs, and give to the teachers practical ideas devoid of any unnecessary theory or detail. It was the writer's privilege to hear a few of these lectures and it was indeed a pleasure to note the concise, clear way in which these men gave to the teachers a definite idea of many of the most important facts in connection with Botany, Pomology, Entomology etc.

The pupils in this course are given practical instruction concerning weeds and weed seeds, propagation of flowers, inoculation of seed with legume bacteria, food values, fungous diseases, milk testing, fertilizers, care of poultry and many other important features of agricultural life.

The teachers receiving this instruction are thus enabled to introduce Agriculture into the country school in an efficient way. In a great many cases the teacher and the pupils have a school garden in which to carry on experiments of different kinds or to grow flowers to beautify the grounds.

The teacher if she be really interested in the subject and in the welfare of the community is certainly enabled to carry on a work of great benefit to the neighbourhood.

In many of the schools visited we found the children keeping note-books in which they recorded the lessons which they had received from the teacher. In one school I noticed a note-book which contained notes on the following, besides much other useful information;—Importance of cleanliness in milk; the danger of the house fly; how to grow a grape vine; how to make and care for a hot bed; wheat rust and its remedies, and the Seed Control Act.

The gardens were often given over entirely to experimental work and the children showed a lively and intelligent interest in awaiting the results. In some instances, of course, the work was a failure, but there was always a good reason when such was the case. Great credit must be given the educational and agricultural authorities for the efficient way in which they have initiated this important and difficult work. Any mistakes and failures in the work in some parts have been more than amply repaid by the great success which has attended the efforts of many others.

It was a noteworthy feature that where the best work was carried on in agriculture, we found the best of conditions in other features of the school work. The children were brighter and more enthusiastic, the discipline better, the premises neater and more comfortable, and the teacher a "live wire" in the community.

Where such is the case we find that the opposition of the neighbourhood has been replaced by encouragement and enthusiasm. When such a teacher intends to leave the school, every effort is made to retain her services, and if this cannot be done, a teacher with similar training is hired in her place. To-day many of the School Boards insert in their advertisements; "One with Agricultural training preferred". This serves to show the trend of affairs in many parts of Ontario.

Let us hope that the day is not far distant when a similar condition will prevail in this province. The possibilities of improvement in our agricultural methods are enormous and one of the best ways of improvement is to show the children—our future farmers—some of the means of realizing these possibilities. Then we shall be educating them, not merely to read and write, but to do the tasks intelligently which they are going to confront in their daily life. It is then and only then that we shall be carrying out the work of educating our children in an efficient and profitable way.

J. E. Mc O.

HOW TO AVOID SILO-FILLING ACCIDENTS

BY observing three simple rules, the farmer who is using silo filing machinery for the first time may avoid some of the accidents which occasionally damage new machines beyond repair.

Here are the things that the inexperienced man should do:

1. Be sure that the machine is being run at the proper speed.

2. Take care that corn is never put into the machine until the motion is up to full speed.

3. In stopping be careful not to shut off the power until the elevator is empty.

If the elevator is not empty the cut material will fall back and lodge in the fans. Then when the machine is started again, the cut corn jams the fans and as a result they are bent or broken.

at Montreal, is as follows: From Grand Trunk Railway depot and from Canadian Pacific Railway depot, (Windsor station), take Windsor and St. Lawrence street cars, going East; change car at Mount-Royal street, going East; get off at Frontenac street. From Canadian Pacific, Viger station, take St. Denis street car going North; change at Mount-Royal street going East; get off at Frontenac street.

FACTS ABOUT SHEEP

Worth Serious Thought by Canadian Farmers

IMPORTS into Canada from United States of Sheep for Slaughter, 1913, 229,743 head.

Imports of Wool into Canada, 1913, 9,209,170 lbs.

There are, according to the 1913 census, 2,128,531 sheep in Canada, shearing in the neighborhood of about 13,840,000 pounds of wool. This number represents but a small measure of what Canada's resources will permit in sheep production.

With its boundless areas of undeveloped land, why should Canada be under the necessity of importing its supplies of wool and mutton when sheep can undoubtedly be raised with profit not only in connection with mixed farming but as well under conditions where cultivation of the land or the grazing of other animals is impossible?

ADVANTAGES OF SHEEP RAISING

1. The sheep is a dual purpose animal, producing both wool and mutton.
2. The initial expenditure is small. Every farmer can well afford the investment of the necessary capital in a few sheep.
3. Rapid monetary returns are received, the wool clip and the lamb crop being saleable annually.
4. Expensive buildings are by no means necessary. A warm lambing pen is required, but for the aged sheep, a sheltered shed to protect them from the winter winds is alone sufficient.
5. Weed destruction represents another asset. Sheep will eat and relish almost every class of weed.
6. Sheep admittedly improve soil fertility. Their manure is rich and uniformly distributed.
7. Except at certain seasons of the year, less time and attention need be bestowed upon the care of sheep than in the case of almost any other animal without thereby endangering succesful results.

LIVE STOCK BRANCH

Department of Agriculture
Dominion of Canada

OFFICIAL CANADIAN AYRSHIRE RECORDS

THE Third Edition of the Ayrshire Milk Records has just been received from W. F. Stephen Esq., Secretary, Huntingdon, P.Q.

The booklet contains much valuable information for Ayrshire breeders, and gives cuts of a number of well known Ayrshire animals.

We quote a few paragraphes relating to the Records of Performance test:

The years of Record of Performance work demonstrate that the Ayrshire cow is capable of large production. The test has revealed that we have some wonderful producers, as the records published in this book indicates.

The test has further revealed wonderful uniformity in milk flow, as well as a high average of butter fat. As these records have been made under ordinary conditions, they go to prove our contention that the Ayrshire cow is the most economical producer of all the dairy breeds.

The dairy ability of a breed should not be judged alone by what a single cow, or several cows can do at the pail, but what is the average production of the breed. Then too it is the long test that is valuable in showing what may be expected from a dairy herd, for the cows must be fed and cared for the whole year, so that while a week's test or a month's test may be of interest, it does not in any way determine whether or not, the cow is a paying proposition.

After a fair trial Ayrshire breeders are confirmed in their opinion that the YEARLY test is the ONLY means of determining the true worth of a dairy cow, and ultimately the value of a breed.

While Ayrshire men believe in liberal feeding, they do not approve of forced records, and discredit any attempt to put such before the public. Thus we are slowly but surely demonstrating to the dairy farmers of Canada the merits of "Our Favourites". This has caused a wholesale demand for Ayrshires from coast to coast, and wherever the Ayrshire cow has gone she has "made good" to the pride of the breeder and the owner. Surely there is a great future before the Ayrshire cow.

RECORD OF PERFORMANCE TEST

Ayrshire Cows and Heifers that have qualified during July and August, 1914

Name of Cow	Owner	Lbs. Milk	Lbs. Fat	% Fat	No. Days
Mature Class					
Blossie of Maple Hill—27558,	Wilson McPherson & Sons, Silverdale, Ont.	11862.	429.	3.62	319
Dainty Lass –12657,	Easton Bros., Charlottetown, P.E.I.,	11086.	435.	3.93	338
Burnside Elfrida 2nd—27183,	Department of Agriculture, Edmonton, Alta.	10859.	426.	3.92.	353
Blanche—37653,	Wellesley Leeming, North Seneca, Ont.	9724.	380.	3.90	362
Dawn of Hammond—25840,	Wm. Watson, Hammond, Ont.	8534.	322.	3.77	353
Milkmaid 4th—12374,	And. McRae & Sons, Charlottetown, P.E.I.	8504.	371.	4.36	365
4 year old Class.					
Viola of Grandview—28591,	Shannon Bros., Cloverdale, B.C.	8369.	326.	3.89	265
3 year old Class.					
Viola of Grandview—28591,	Shannon Bros., Cloverdale, B.C.	7573.	261.	3.44	331
White Daisy of Hampton, 32083,	H. F. Ambrose, Stewiacke, N.S.	7492.	306.	4.08	359
2 year old Class					
Bluebell—37590,	Ephraim MacPherson, Jr. Copetown, Ont.	9388.	400.	4.25	365
Fairview Lassie 2nd—34190,	Joseph Thompson, Sardis, B.C.	7042.	316.	4.49	336
Floss 2nd—33043,	C. E. Thomas, Lloydminster, Sask.	6168.	278.	4.51	360
Ideal of Cranston—37655,		5796.	246.	4.24	337

THE AYRSHIRE AS A BUTTER PRODUCER

The Official test is proving what a valuable Butter producer is the Aryshire Cow.

To June 1st, 1914, 454 cows and heifers have registered in the Record of Performance test. This immense herd gave a yearly average of 408 lbs. of Butter, a splendid average considering 189 of them were two-yeat-old, and 82 three-year-old heifers.

One cow gave over 850 lbs. Butter, 3 gave over 700 lbs., 22 gave over 600 lbs., 30 gave over 550 lbs., 70 gave over 450 lbs., 140 gave over 400 lbs., a number gave from 300 to 400 lbs. and a comparative few were under 300 lbs. There is a profit in dairying when Ayrshires are kept.

W. F. STEPHEN

Hntingdon, Que. Sec. Canadian Ayrshire Breeders' Association.

DEVELOPING A DAIRY HERD

DEVELOPING or grading up the dairy herd is a matter of greatest importance to every farmer and dairyman, as profit realized from dairy husbandry is immeasurably dependent upon cows that possess the ability to convert feed and care into net profit for their owner. Profit making cows are a pleasure to care for, but inferior ones are a loss and drudgery to their caretaker. Intelligence and application are the dairyman's invaluable assets and without both in harmonious co-operation dairying cannot be made a pleasure and a profit. Dairy husbandry is a business and if made a source of greatest remuneration, business methods must be employed in its management. No dairyman ever failed in business who applied modern business tact to the management of his cows. Dairy husbandry is the most remunerative and highest type of agriculture and, when intelligently pursued, the most pleasurable.

The herd is the foundation of the whole dairy business. Profit depends more upon this part than any other single point. Much, of course, rests upon proper feed and care, but the best of care and feed will not make a poor herd profitable. The first object of the dairyman should be to build up a profit paying herd. Pedigree is of great value, but not indispensable. Individual performance summarizes the place of every animal in the herd. If evidences of inefficiency show up after a carefully kept record has been made, the animal should be immediately removed from the herd. If of good beef conformation she might prove profitable to some man who is raising beef, but she has no place in the dairy herd. No one breed possesses all the most desirable qualities essential to profitable dairy husbandry, therefore do not keep shifting from one breed to another or, worse still, intermixing blood of two distinct breeds. Such practice deflects and alters the laws of improvement and conclusively defeats the purpose sought after.

There is a strong tendency among farmers and small dairymen to keep selling and purchasing cows to replenish the herd. This practice in a few exceptional instances, such as maintaining a herd for retail milk supply near a large city, may result profitably, but for the average dairyman it is not to be recommended as the most advisable nor practical method of maintaining a dairy herd. Selecting individuals of the strictly dairy type (this applies to grades and pedigree stock alike) and mating to males equally as judiciously selected, and retaining heifer calves from the highest producing cows, both in milk flow and butter fat content, is the most expedient and profitable method of grading up a dairy herd. For the past eighteen years I have been following this method of grading up my herd. At times I have disposed of cows that were too far below my standard, but I have not purchased, except a pure-bred animal now and then, to improve my herd. I must say that some of the pure-bred stock I have purchased has not proven as profitable from the standpoint of butterfat producers as some of my grade cows that have been produced from a line of carefully graded up cows. I desire to caution beginners in dairy husbandry against the idea that you ought to dispose of your grade herd and purchase thoroughbred cows in order to get into line for profitable dairying. Better, by far, commence a systematic improvement through grading up with the foundation already at hand, by the elimination of the inferior individuals and the purchase of pure-bred stock as conditions permit.

The importance of using sires to head the herd selected from a long line of superior producing cows of known individual merit cannot be fully estimated until one has thoroughly studied and carefully noted the application of the laws of animal breeding. The value of good sires in live stock improvement is underrated, simply because farmers and dairymen lack knowledge gained from strict application of the principles governing animal reproduction. Experienced dairymen, who have begun at the foot, after years of grading up a dairy herd, understand to the fullest extent the vital importance of well selected sires to head the herd. A good sire is a paramount asset to the dairy business, a poor one a curse and condemnation.

THE DAIRY

A MAGNIFICENT GIFT TO GREAT BRITAIN

Order for 4,000,000 pounds of cheese to be delivered to the Provincial Government within ten weeks

Sir,

THE Government of the Province of Quebec has decided to offer to the Imperial Government, under existing circumstances, 4,000,000 pounds of cheese. It has entrusted to our Society the furnishing of this product. The transaction has been effected in such a manner as to protect the interests of both the government and the producers, as well as the reputation of our cheese.

The Society must deliver each week from 4,000 to 5,000 boxes of cheese, and for each week's delivery it will receive the average price of the four principal markets of Ontario, with the addition of one-eighth of a cent per pound for No. 1 cheese. This addition was necessary seeing that for some time past the prices obtained by the Society were higher than those paid on the best markets of the neighboring Province. This addition fully protects the interests of the producers.

In entering into this arrangement we have remained faithful to the policy adopted in the first instance, to pay for cheese according to its value, so as to reward the painstaking manufacturers and patrons who are careful, above everything else, to produce a first-class quality of cheese.

We hope then that both manufacturers and farmers will put forth their utmost efforts to deliver a particularly choice article. The honor of the Province and the reputation of our dairy products are at stake. If the cheese delivered is of the highest quality, it will assure the future of the Society and will contribute to the still greater prosperity of the dairy industry.

Before the organization of the Society our cheese had a bad reputation on the English market. It is necessary to seize the present occasion to compel the disappearance of all the prejudices which may still exist against us. We shall never be able to find a better opportunity.

There will be three classes of cheese and for each class a different price, No. 1 cheese obtaining a higher price than inferior qualities. The difference will be one-eighth of a cent per pound between each quality or class.

In accordance with the arrangements made with the Government, the price of the cheese will be regularly paid weekly and each producer will immediately receive the amount due to him.

To facilitate the more easy filling of this order, the Society is ready to accept new members, who, in order to participate in the advantage which it confers, must subscribe for one or two shares of the capital stock of the Association. All agricultural dairymen and all well-to-do farmers should seek to increase the capital of this Association, in order to place it in a position to become still more useful to the agricultural community. It has done much good in the past and if its capital were larger, it would be able to render a still greater service.

Your devoted servant,

AUGUSTE TRUDEL

Manager, Quebec Cheesemakers' Co-operative Agric. Society

27 William St.,
Montreal, 20th August, 1914.

Don't hesitate to put money into the right kind of a sire. I would recommend to any farmer or dairyman, better mortgage your property to purchase a good sire to head your herd than to squander a moment or a dollar with an inferior individual. The sire that heads my herd is out of a dam that produced 764 pounds of butter in 344 days. I have to purchase another bull soon and I shall not buy one from a dam of the right breeding that has less than a 900-pound butter record in a year.

Ohio Farmer

REASONS FOR THE QUEBEC SUCCESS IN BUTTER AT TORONTO

THE result obtained last week at the Toronto Exhibition by the several factories who had exhibits in competition with all other provinces of the Dominion, is more than gratifying to the factorymen of our province and to the methods encouraged by the Provincial Government.

The butter submitted to the judge was divided in 4 sections, and we have carried first and second prizes in every section.

This result speaks for itself as to the quality of butter produced in the province of Quebec, and we can attribute this to three principal causes:

1st—The skimming of milk at the factories, under proper conditions and careful treatment of the cream.

2nd—Pasteurization according to the best methods from experience in Denmark and New-Zealand, under the supervision of Mr. J.-D. Leclair, director at the Provincial Dairy School at St-Hyacinthe.

3rd—The system of auction sale by the Quebec Cooperative Society, under the patronage of the Provincial Government, where all the consignments are classified according to their value, has been a stimulant to factorymen, and no doubt improved the quality of butter generally in our province. Government inspectors' reports are made on each lot consigned to the Cooperative, and this is a great help to factories wishing to market only the best article.

The results obtained at the Toronto Exhibition show conclusively that in order to get the best quality of butter, cream, even the best, should be pasteurized, and that to force it into practice, butter should be graded and each grade sold according to quality.

GREAT VICTORY OF QUEBEC BUTTER MAKERS AT TORONTO

Quebec carried off 20 out of 24 Prizes in the Butter Competition at the Toronto Exhibition. Credit to the Cooperative Society of Cheese and Butter-Makers of Quebec

THE Province of Quebec has shown up splendidly at the Toronto Exhibition, where its exhibitors in the butter competition, carried off not only all the first prizes awarded but also twenty out of the possible twenty-four prizes.

This year the trophy has been won by Mr. Achille Fournier of Gentilly, Co. of Nicolet, having a score of 97.50 points out of one hundred.

A fact which must not remain unnoticed is that all the prizes gained in the Province of Quebec have been won by members of the Cooperative Agricultural Society of Cheesemakers of Quebec. This society has been promoted and encouraged by the Provincial Government, which has given a great deal of attention and care to its expansion and success.

Following is a complete list of the prizes obtained for butter at the Toronto Exhibition:

CLASS 273

1st Section—Salted.

No. 9. Albert Houle, St. Simon, Bagot, 1st Prize, 97.25.
No. 27. Albert Bourbonnais, St. Polycarpe, Soulanges, 2nd Prize, 297.
No. 17. Achille Fournier, Gentilly, Nicolet, 3rd Prize, 96.75.
No. 28. Christophe Collette, Vercheres, Vercheres, 4th Prize, 96.5.
No. 11. Edgar Tessier, St. Cesaire, Rouville, 5th 96.25.

2nd. Section—Unsalted.

No. 11, Achille Fournier, Gentilly, Nicolet, 1st Prize, 97.50.
No. 8. Edgar Tessier, St. Cesaire, Rouville, 2nd. Prize, 97.35.
No. 12. Henri Bergeron, Deschaillons, Lotbiniere, 3rd. Prize, 96.75.
No. 28. Matthew Weir, Winnipeg, Manitoba, 4th Prize, 96.50.
No. 17. Christophe Collette, Vercheres, Vercheres, 5th Prize, 96.25.

3rd. Section—Butter in 1 lb. Rolls.

No. 1. Aldei Brault, Ste. Sabine, Iberville, 1st Prize, 96.5.
No. 5. Albert Houle, St. Simon, Bagot, 2nd. Prize, 96.5.
No. 26. W. H. Jackson, Alberta, 3rd Prize, 96.25.
No. 1. Ed. Frechette, St. Felix; de Valois, Joliette, 4th Prize, 96.75.
No. 7. Edgar Tessier, St. Cesaire, Rouville, 5th Prize 96.5.

4th Section—Butter in 4 ten lb. boxes.

No. 5. Albert Houle, St. Simon, Bagot, 1st Prize, 96.
No. 2. Exelius Desroches, Ste. Beatrix, Joliette, 2nd. Prize, 95.
No. 1. Ed. Frechette, St. Felix de Valois, Joliette, 3rd. Prize, 94.75.
No. 14. Arthur Tessier, Ste. Helene, Bagot, 4th Prize, 94.5.
No. 15. P. Palleson, Calgary, Alberta, 5th. Prize, 94.25.

Special Trophy.

A. Fournier, Gentilly, Nicolet, 97.50.

HIGHEST AVERAGE NUMBER OF POINTS OBTAINED

A. Houle, St. Simon, Bagot, 1st Prize, 96.125.
E. Tessier, St. Cesaire, Rouville, 2nd. Prize, 96.0625.
P. Palleson, Calgary, Alberta, 3rd. Prize, 95.

BUTTERFAT PLUS OVERRUN EQUALS BUTTER

Sir,

AS a subscriber to the Journal of Agriculture, I would like to know the difference between butter and butter fat per hundred, also, where I could get a babcock tester and the price of one for about ten cows. P. J. Milanville, Que.

Answer: The difference between butter and butter fat per hundred may vary from 12 to 20 per cent for overrun—overrun being the water, salt and casein added to the butter fat during the process of churning.

Overrun in creameries is usually 15 percent, so that one hundred pounds butter fat gives one hundred and fifteen pounds of butter. Cream therefore, testing twenty-eight percent butter far would yield 32.2 lbs. butter per 100 lbs. cream—that is 28 multiplied by 115 and then divided by 100 would equal 32.2.

A twelve-bottle Babcock milk-tester would be advisable and a sample from each cow can be run

POULTRY

FATTENING MEANS PROFITS

ADVANTAGES

THE majority of farmers in Quebec take but little trouble in preparing their poultry for market. The result is that much of the dressed poultry is sold in a lean condition, resulting in an unsatisfactory product for the consumer and actual loss to the farmer who sold the lean poultry. There are a few fattening houses doing good business in the Province, but the average farmer still continues to market his surplus stock direct from the range.

A thin bird is not attractive when dressed, and is not appetizing when roasted. The flesh appears shrunken and the bones are prominent. When roast-

---

through at one time. The prices of these testers are, for a six-bottle tester $9.00, up to a twelve-bottle $14.00, and with each tester is included a set of bottles, measures, etc. They can be had from the De Laval Dairy Supply Co., Montreal, or any other Dairy Supply.

JESSIE D. GRAY,
Macdonald College

HOW TO REDUCE CREAM TO ANY DESIRED PERCENTAGE OF FAT

HAVING two milks or creams of different richness and requiring to mix them to form a third of different percentage of fat, use the following method: Draw a square and at the two left-hand corners, write the percentage of fat in the two fluids to be mixed. In the center place the percentage required; at the two remaining corners, put the numbers which will be the difference between the two numbers with which they stand diagonally in line. Thus: Given 4 per cent milk and 33 per cent cream—to make 18 per cent cream. 18 from 33 equals 15, which is placed in the upper right-hand corner; 4 from 18 leaves 14, placed at the lower right-hand corner. This means that it would require 15 pounds of 4 per cent milk and 14 pounds of 33 per cent cream to make 18 per cent cream.

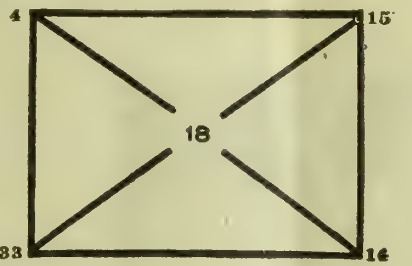


Diagram for calculating How to Mix Cream

Where skimmed milk is to be used for standardizing the cream, the example would be as follows, (assuming that the cream tests 40 per cent fat.) Instead of the 4 place the figure 0 and instead of the 33 put 40. At the center, in place of the 18, put 32. Subtracting 32 from 40 leaves 8, which is placed at the upper right-hand corner; 0 from 32 leaves 32, which is placed at the bottom left-hand corner; or, in other words, it will require 8 pounds of skimmilk mixed with 32 pounds of 40 per cent cream to make 32 per cent cream, or to each 4 pounds of 40 per cent cream add one pound of skimmilk to make 32 per cent cream.—*Hoard's Dairyman.*

A DISTINCTIVE COW

SANDWICHED in among ordinary yields there are occasional extraordinary yields that make glad the heart of the good cow's owner because he has taken the trouble to record her actual production. While the ordinary cows in July were giving their meagre doles of seven hundred or six hundred pounds of milk and twenty-four or twenty pounds of fat, a grade cow in Quebec gave 1,279 pounds of milk, testing 5.8, yielding 74 pounds of fat.

A cow like that is surely accomplishing something. In six months of such work she would give as food for humanity more digestible nutrients than would be afforded by five average dressed steers. She is giving far more back from the energy contained in her food than the best skilled engineer can obtain from a quadruple expansion engine for the fuel consumed.

It pays to feed good cows well; it also pays any farmer to find out, by keeping records of each cow, just what each produces. In the ordinary way, the above excellent cow would be lumped in with the "average" of the district, while she really deserves a distinct niche to herself in the hall of fame. Perhaps dairy records will discover some distinctive cows in your herd. Build your herd of selected individuals. C. F. W.

WHAT SAMPLING REVEALS

A herd owner may ascertain from the creamery that his average is 40 pounds of fat per cow for the month and yet have a dim idea that some of his cows are better producers than others, but probably few men are prepared for the veritable surprises encountered when they commence regular weighing and sampling. To take the case of two 2-year-old heifers that freshened this spring, last month one gave 30 pounds of fat, the other gave 46 pounds. One 5-year-old in the same herd of grade Jerseys gave 67 pounds of fat, and another 5-year-old gave only 36 pounds. The owner would scarcely believe that one mature cow is thus earning, with fat at 27 cents per pound, eight dollars and thirty seven cents more than her stable mate in just one month. What will the difference be for the whole year? That is the crucial test.

Between two 3-year-olds in the same herd, that both freshened in March, there was a difference last month of 19 pounds of fat, worth over five dollars. Similar differences are to be found in many herds, illustrating very clearly that it is palpably unfair to take a general average of the herd unless they are decidedly more even in production than those cited above. Records of individual production alone can give this valuable information to the owner. Milk and feed records may be obtained free on application to the dairy commissioner, Ottawa.

C. F. WHITLEY,
Dairy Div., Ottawa

RICH MILK DUE TO COW, NOT FEED

IN the perusal of a number of cases of prosecution in England for selling milk deficient in fat, as reported by the Dairy World, we were struck by the constant reference by the parties to the trend of the fact that they fed the best of feed. The general idea seemed to prevail with the courts and the dairy farmers that poor milk might be due to the lack of quality in the feed. In no instance did we see any reference to the fact that the cow herself and not the feed was responsible for the percentage of fat in her milk. This shows a lamentable ignorance on the part of the English dairy farmers as to the true cause of low fat content in milk. If we are to have milk high in percentage of fat we must look for it in the breed or individual character of the cow herself and not in her feed. Feed can affect the quantity of milk but not its percentage of fat. Were it not so, we could change a Holstein over to a Jersey, or vice versa, by the simple act of feeding.

AN EXPERIMENT WITH TUBERCULOSIS

THE problems presented by the wide-spread existence of tuberculosis in dairy cattle are manifold. They bear on human experience in connection with the hygiene of the milk-supply, which is assuredly a matter of no small concern to all classes of society. The question of tuberculosis cattle involves the economics of agriculture to a far greater degree than the uninitiated can appreciate; for the disease has manifested itself so widely that the hope of complete eradication must be deferred for a long time, to say the least. Furthermore, the outcome of the management of tuberculous herds may point the way for advantageous applications in the field of human treatment or prevention.

In view of the enormous practical difficulties in the way of the complete eradication of tuberculosis in cattle by the wholesale slaughter of all animals known to be infected with tuberculosis, schemes for utilizing the latter have been devised. The most prominent of these is the system whereby tuberculous cows are isolated and used for breeding purposes, the calves being removed from the mothers at the earliest moment and brought up without further exposure to the disease. This has been rendered possible by the finding that such young are regularly born in perfect health, and entirely free from tuberculosis. The affected breeding cattle in this way do not become an entire economic loss. A ten-year investigation, carefully verified and supervised by government officials, has just been reported by Brooks in conection with what is probably one of the most valuable herds of Holstein-Friesian cattle in the world.

The object was to produce a herd of Holstein cattle free from tuberculous taint and yet endowed with all the most valuable strain characteristics possessed by this breed. Animals were selected because of their desirability, entirely independent of the presence or absence of tuberculosis. The tuberculous animals greatly outnumbered the non-tuberculous. Three hundred tuberculous animals were studied. The existence of tuberculosis was determined by the administration of treble the official dose of tuberculin, repeated in non-reacting animals three times at intervals of six months. All animals reacting to either test were removed at once to the tuberculous farm so that there was no possibility of the transmission of infection from the tuberculous group to the healthy one. At birth the calves are immediately taken from the mother. Feedings are on pasteurized milk collected indiscriminately from sound and tuberculous animals.

Of more than two hundred calves born of the tuberculous herd, not one has become tuberculous, although all have been tested three times by massive doses of tuberculin. These animals are rather more resistant to tuberculosis than animals born of non-tuberculous parents. No falling off in type, in milk production or fertility is present in these calves no increase in deathrate exists among them as compared with the offspring of healthy cattle, no falling off in value takes place, and several of the most valuable cows and bulls in the world are of this ancestry. These facts, says *The Journal of the American Medical Association*, remain constant even where at least three generations of known tuberculous parentage exist.

The Farmer

Cleaning off the boards of the fattening batteries. These batteries are especially adapted for fattening in large plants. (Courtesy U. S, Dept. Agric.)

ed the meat is dry and tough.

A plump, well-finished chicken has a rich flavor and is extremely palatable. There is an abundance of tender meat of good quality. When chickens have been properly fattened the meat is highly nutritious and an increased demand is created.

Lean birds bring low prices, while plump birds are in greatest demand at top prices and yield largest profits. Fattening means heavier birds and meat of a superior quality.

The fattening of poultry is a finishing process, the object being to prepare, in the best possible way, poultry flesh for consumption.

SELECTION

At this time of the year, when the average farmer should be putting his laying flock into the winter quarters, the flock should be carefull selected. All surplus cockerels and undesirable pullets should be fattened. Also, in the early fall of the year prices for dressed poultry are usually higher than later in the season. It should be the farmer's object to make the most money out of his flock and proper fattening of all surplus stock will increase the profits.

FEEDING

Best results are obtained by feeding all fattening birds on soft mashes. The gain in weight is greater and the quality of the flesh is superior when ground grains are used than when the chickens are fattened on whole grains. Use oatmeal feed, finely ground buckwheat, and cornmeal, the two former in largest proportions. As alternatives, middlings and low-grade flour may be used.

These ground grains should be mixed thoroughly and moistened with sour milk or water. Sour milk is one of the best of poultry foods; it develops the tissues and improves the quality of meat. The proportion of milk to the mash mixture is about 2 lbs. of milk to 1 lb. of mash by weight.

CONFINEMENT

The poultry may be pen-fattened or crate-fattened. Before starting to feed, however, the birds should be starved for 24 hours. This cleans out the digestive system and puts the bird in good shape for the special feeding during the fattening period.

Where a small number of birds are to be fattened they can be placed in a small pen, but where there is a large number they should be fattened in crates or batteries. The most profitable fattening period is from two to three weeks. If the fattening has been done properly two weeks is sufficient. The third week is sometimes used to finish the birds off nicely, but since the birds gain but very little it is doubtful if three weeks are as profitable as two weeks. Great care must be exercised in feeding since the birds are apt to go "off feed". Do not feed too heavily the first week but rather keep the birds with good appetites. Feed them three times a day but give them just a little at each feeding. Then during the second week feed them all they will eat,since the object is to make the largest possible gain in weight. Make the mash like a thick gruel of good consistency. Keep the troughs clean always and do not allow feed to remain before the birds. They should have their feed eaten up within a few minutes after being fed.

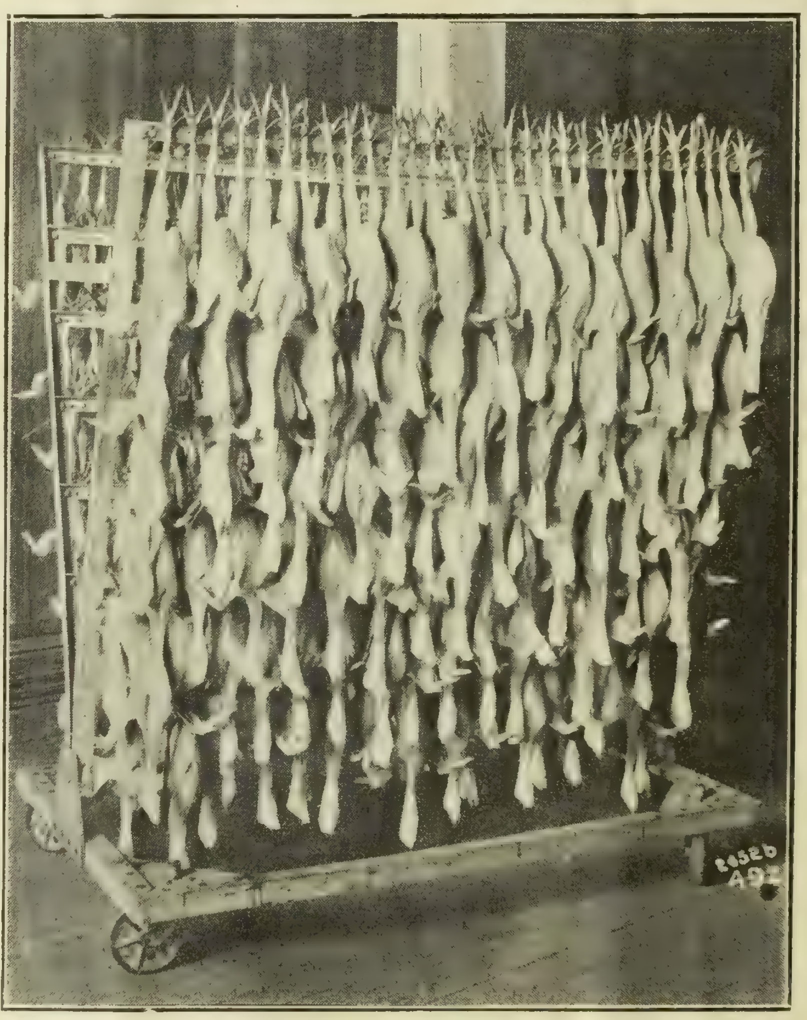
The most profitable weight to start fattening is when the birds average about 4 pounds. Ordinarily a chicken will gain 1 pound in weight and then there is the higher price for better quality.

STARVING

When the birds are ready to be killed they should be starved for 24 hours. The cleans out the crop and intestines and the birds will keep in good condition for a longer time and will be of better quality. Above all, never kill chickens with food in the crops.

RECORD

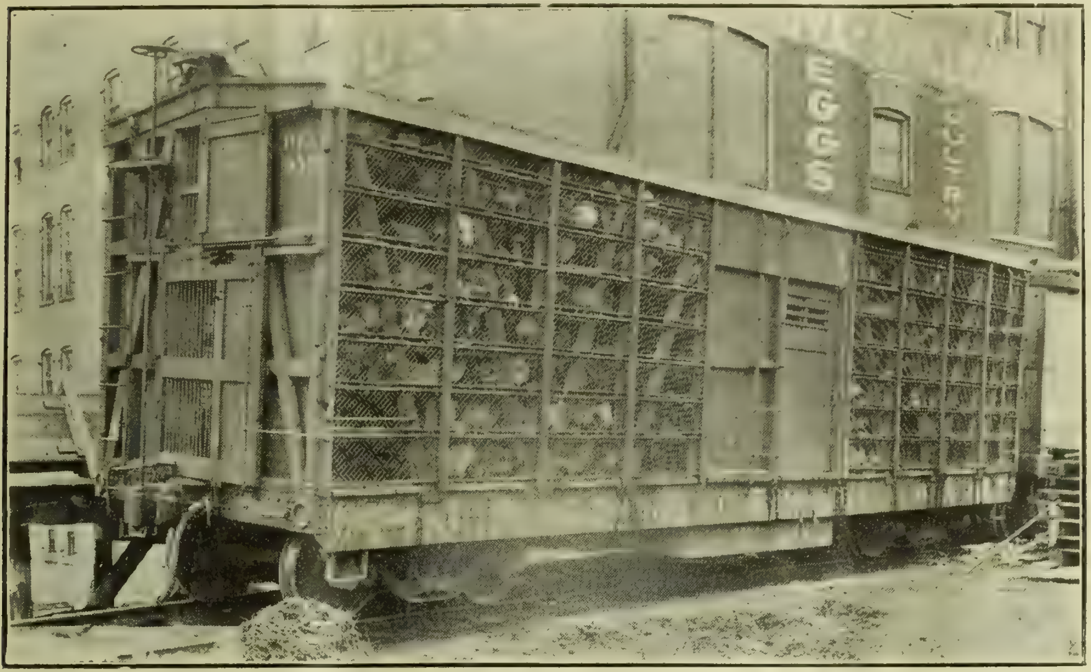
Farmers would do well to keep a record of



WELL FATTENED
Roasters such as should be produced by the farmers of Quebec. These roasters are on a modern cooling rack previous to being packed (Courtesy U. S, Dep. Agric.)

expenses and receipts in connection with the fattening of their fowls. The accompanying form of fattening record, used at Macdonald College, is simple and complete.

M. A. JULL



A carload of live poultry on the way to market (Courtesy U. S, Dept. Agric.)

MACDONALD COLLEGE — POULTRY DEPARTMENT

FATTENING RECORD.

19............

DATE.............................. CRATE NO..............................
NO. CHICKENS.............................. WEIGHT..............................
COST PER LB.............................. TOTAL COST..............................
DATE SOLD.............................. WEIGHT DRESSED..............................
SOLD PER LB.............................. AM'T RECEIVED..............................
CASH GAIN OR LOSS..............................
RATION FED..............................
METHOD OF FEEDING..............................
PRICES..............................

FEED CONSUMED.

1st WEEK	2nd WEEK	3rd WEEK	TOTAL	AVG.	COST PER LB.	TOTAL COST	AVG. COST

WEIGHINGS.

ORIG. WT.	STARVED 24 HOURS	1st WEEK	2nd WEEK	3rd WEEK	TOTAL	AVG.	STARVED 24 HOURS	AVG.

AMOUNT AND COST OF ONE POUND OF GRAIN PER POUND OF GAIN WEIGHT.

TO KILL POULTRY PROPERLY

Bleeding the Best Method

THE common practice of killing fowls has been to chop off the head. This method, however, is not afr short of barbarie and could only be justified in times of war.

The method used will depend largely upon the market for the birds. If they are being prepared for the local market then the neck may be dislocated. Where they are killing to be shipped some distance the birds should be stuck and bled.

Dislocating the neck is a simple operation. The legs and wings are grasped in the left hand and the bird is held head downwards. The head is grasped between the thumb and fore finger, or between the first two fingers, of the right hand. By putting pressure on the right hand the neck is stretched and at the same time the head is bent backward. It takes a pretty good pull to break the neck but with a little practice in stretching with the up-and-backward movement the method becomes easy. It is a clean operation as no blood is allowed to run; it collects in the neck where the neck was broken. Where the poultry is to be consumed immediately this method is satisfactory.

The best method of killing poultry is in sticking them. The birds are suspended from the ceiling to a height about level with the shoulder of the operator. The birds are stuck in the roof of the mouth and are bled in the throat, sometimes one movement being gone through before the other. Some experts claim that it is best to bleed from the throat and then stick. Usual by the brain is pierced from the inside of the mouth the knife running down the groove until the top of the skull is reached. Then the knife is given a sharp turn and is withdrawn.

Next the vessels of the throat are pierced and bleeding begins. Piercing the brain kills all sensation and when the bird is properly stuck the feather muscles are paralyzed which aids greatly in plucking. The blood vessels run down each side of the neck and just at the base of the skull they are joined. An expert killer can sever the vessels at the juncture but an amateur should be satisfied with severing each vessel separately. It requires considerable practice to locate the proper place to cut. As soon as the sticking and bleeding are completed a weighted can is hooked on to the bird's beak and plucking is commenced. The bird should bleed thoroughly and if the operation has been properly executed the keeping qualities of the dressed poultry are good.

M. A. JULL

TO MAKE A FATTENING CRATE

THE object in view in the construction of a crate for the fattening of chickens is to provide a means of confining the birds in such a way that maximum flesh production will be promoted. The crate should be made to accomodate a good number of birds without overcrowding.

A good crate can be made of laths and a few light boards which are used for the ends and partitions. The crate should be 6 feet 6 inches long, 20 inches high and 16 inches wide. The top, back and bottom are made of laths running lengthwise. The laths on the top and back should be about 1½ inches apart. The laths in front run up and down and are placed about 2 inches apart, so that the birds may eat from the V-shaped trough in front. The laths on the bottom are usually placed ¾ iches apart. Care should be taken to have the back slat on the bottom at least ¾ of an inch from the back, so that droppings may pass through and not accumulate.

A V-shaped trough, 2 inches deep and 2½ inches wide at the top is placed on brackets in front, the brackets being about 2 inches above the bottom of the crate.

This crate is cheap and convenient and a few birds properly fattened will more than pay for the expense of construction.

M. A. JULL

RURAL SCHOOL FAIRS A SUCCESS

FOR the second season in the extension work of Macdonald College the rural school fairs have proven a decided success. Last year there were three school competitions held at Cookshire, Sherbrooke and Shawville, the former being held as a separate school fair while the latter two were held in conjunction with the annual agricultural fairs. The children exhibited their chickens hatched from the eggs supplied them by the College and the competitions, conducted under the supervision of the Demonstrators, proved interesting as well as instructive.

This year the competitions have included ex-

WOMAN'S WORLD

LENNOXVILLE HOME-MAKERS' CLUB

THE Home-makers' Club of Lennoxville held their second meeting, Thursday, Aug. 20th, in the Demonstrator's Office, in the Town Hall, Mrs. Geo. Mitchell, Pres., presiding. The report of the programme committee containing the programme drawn up for the year was read by Mr. J. Robinson, Sec. of the committee. After the business had been transacted, three very interesting papers were read.

Mrs. J. Robinson dealt with the subject "Home" in a manner which showed that she understood what home should be. Mrs. W. Armitage gave a very helpful and suggestive paper on "Sunday Meals".

For the benefit of the strangers present, a paper on the aim and objects of the Home-makers' Club was read by Mrs. Atto. There were a number of visitor who received a hearty welcome, and after the meeting several new names were added to the roll.

HOUSEHOLD SCIENCE EXHIBIT AT SHAWVILLE SCHOOL FAIR

THE Household Science Exhibit at the Pontiac School Fair held on September 11th. was, as a beginning, very good. The exhibit consisted of

1. Bread, rolls, baking powder biscuit, standard cake and candy.
2. Flowers.
3. Doll's outfits and aprons.

No. 1 was judged as to: General Appearance (2), Colour (2), Flavour (3), Texture (3). The flavour and texture were not up to the standard in most of the loaves. The prize loaf averaged up to 8.5. Nearly all the rolls exhibited were good and those winning first and second prizes were almost perfect in all four points. The cake on the whole was not as good as either the bread or rolls. The texture and flavour were with few exceptions very poor. Cooking is not a matter of mere luck and it is to be hoped that the girls will make an effort to first learn the rules re cake-making and then practice to make perfect for next year's exhibit.

Only one exhibit of Baking Powder Biscuits—they were good! Why only one?

The candy, with two exceptions, was poorly made, the appearance, colour, flavour and texture all being equally at fault. The box winning the first prize, however, was a joy as well as a temptation to both judge and by-standers.

The rules regarding the exhibit of flowers were rather indefinite and this made the judging rather difficult. There was, however, a good display, making the contest close and exciting, and the judges seemed to hesitate for a long while in their choice for the second and third prizes. The girls are asked to consider the arrangement next year both as to kinds and colour more carefully. Get some information on this subject, girls.

The needlework was judged by Miss Zollman of Macdonald College from the following standpoints:—1. Neatness. 2. Workstitches and pattern. 3. Choice of material. 4. Trimming. The work displayed, was, as a whole, very creditable and the people showed excellent taste in regard to choice of patterns and suitable trimming. Evidently the rules of the contest were not fully understood by the children as some machine-made garments, as well as some fancy work, were put on exhibition. This work, however, was well done and credit must be given not only to the children but to their mothers for training their daughters. Only a few aprons were exhibited—a larger number, more carefully made, will be expected next year. It is to be regretted that the pupils did not understand that fancy-work was to be debarred from the competition. Little Miss Stanley of Chartris, only 9 years' old sent in a beautifully done piece of Mexican drawn work. The attention of the teachers is especially called to the fact that in both the sewing and the cookery many things not called for were entered. Considering this was the first year such an exhibit was put on, every possible allowance was made. Next year, however, definite rules governing the competition will be laid down, and the teachers are asked to see that their pupils follow these rules, in order that disappointment, if not discouragement may be avoided.

The School of Household Science, Macdonald College, will be pleased to give any information regarding cooking, and sewing, etc. Get your information now, girls, and begin to practise.

A good beginning has been made and great things will be expected next year.

F. CAMPBELL

THE CANNING OF FRUITS AND VEGETABLES

UNTIL methods of canning were known and glass jars were invented with covers and rubber rings to make them air-tight, fruit was preserved either by dring or by being cooked with nearly its own weight of sugar. As both methods alter considerably the flavour of the fruit and as the former, carried out at home, is a tedious process, and the latter uses a great deal of sugar, producing a rich "preserves", it is wiser to can the principal food supply.

An abundance of fresh orchard and garden products can usually be had in season but there is no reason why, during the winter months, these should be absent from the daily bill of fare. The surplus supply of these products that cannot be marketed to advantage in season can readily be preserved for future use, at the same time retaining their natural flavour and food value. Because of present high food prices this question is surely of vital importance, especially to those with orchards and gardens.

As sugar in sufficient quantities acts itself as a preservative, the making of "preserves" did not involve the problems that must be considered in canning fruits and vegetables with little or no sugar. One boiling in an open kettle was sufficient. Indeed the "open kettle" method is still used by some in canning but is not as efficient and involves more labour than cooking the food in the jars as outlined below.

Minute forms of life called bacteria are present everywhere in untold numbers and are practically the sole cause of the "spoiling" or fermenting of canned food. These bacteria may be killed by simply boiling the food, but especially in the soil are found bacteria that form what are called "spores" which we may compare to the seeds of a plant. These spores are not killed by boiling but, after being boiled once, they are so softened that in a warm room they grow easily into bacteria. Orchard and garden products, especially vegetables, come so often in contact with the soil that they are usually covered with these spores and the process of canning known as "fractional sterilization" is adopted with the idea of killing these. This consists in keeping cans or jars in boiling water for a specified time upon each of three consecutive days. The first boiling kills the bacteria and *softens* the spores. The jars must

---

hibits of cereals, potatoes, flowers and poultry. These juvenile exhibitions are inspiring and should count for much in the future development of Quebec's agriculture. The number has increased to ten, viz., Scotstown, Cookshire, Ayer's Cliff, Sherbrooke, Huntingdon, Howick, Cowansville, St. Anne de Bellevue, Shawville and Aylmer.

The entries in poultry have been good, varying in number from fifty to over three hundred. Each show provides a means of comparing the success obtained by each pupil in the rearing of the chickens, and while the quality of the stock on the average has been good, there have been notable differences in the development of the individual flocks. In many cases the birds of one flock were twice as large in size as those of another hatched at the same time. The show is a great educator for the exhibitors who have shown a keen interest in their work. The success of this line of work augurs well for the future.

M. A. JULL

NEW STANDARD BREEDS

THE following breeds and varieties of breeds have been admitted to the standard of perfection. Rose Comb Anconas, Silver and Golden Campines, S. C. Blue Andalusians, R. C. White Minorcas, Salmon Faverolles, Mille Flem Booted Bantams, Grey Japanese Bantams, Buff Ducks and Pencilled Runner Ducks. All these varieties will now be recognized as standard varieties.

STANDARD WEIGHTS FOR LEGHORNS AND ANDALUSIANS

UP to the present Leghorns, Anconas, and Andalusians have been known as non-weight varieties. Now, however, the Leghorns and Andalusians have standard weights. They are as follows: Leghorns; cock, 5½ pounds; hen, 4 pounds; cockerel, 4½ pounds; pullet, 3½ pounds—Andalusians; cock, 6 pounds; hen, 5 pounds; cockerel, 5 pounds; pullet 4 pounds.

NOTES

A new method of preserving eggs is described by M. de Keghel as follows: A coating material is made up of: Peanut oil 14 gm., palm oil, cocoanut oil 16, prepared lard 47, spermaceti 2, trioxymethylene 1, and powdered thymol 0.05 gm. Before the eggs are coated they should be sterilized with a 0.2 per cent solution of fluorid of silver. It is stated that eggs will keep fresh for 18 months and the cost is very little.

Farmers should be preparing for winter egg production and the laying flock should be carefully and thoroughly selected. The laying fowls should be in their winter quarters by the middle of October at the latest. The birds should be laying by the first of November and they should be kept at it. Select for laying only those pullets which are well developed and fully matured. Good lealth and vigor are absolutely essential if eggs are to be expected. Insist on keeping vigorous stock for it means money.

The proper way to pluck poultry for market is dry. Do not scald if you can help it, for dry-plucked poultry is so much nicer in appearance and it commands a higher price.

"Milk Fed Chickens" are profitable. Where chickens are fattened on a mash which has been moistened with sour milk or buttermilk the quality of the flesh is of the highest and commands highest prices. Milk feeding is very profitable.

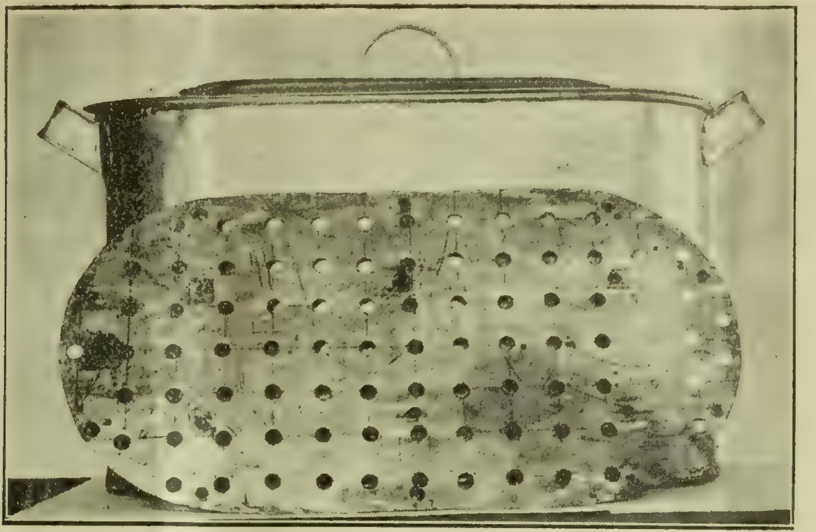


Fig. 1. Tin wash boiler, with false bottom, for sterilizing.

then be kept in a warm place until the second day when the spores will have grown into bacteria which are killed by the second boiling. The jars are again kept in a warm place and the third day the boiling kills any bacteria that have escaped former boilings. If these general principles are carefully followed any fruit or vegetables may be successfully canned.

Cleanliness must be strictly observed throughout the canning process. Select firm fruit and firm *young* vegetables that have grown rapidly. Gather them early in the morning if possible and keep them in a cool place until ready to use. Wash them thoroughly, using several waters for root vegetables. Pack carefully in jars. The most satisfactory jar is the type here illustrated, the rubber ring and glass top being held in place by a strong wire spring. Use *new rubbers* each year.

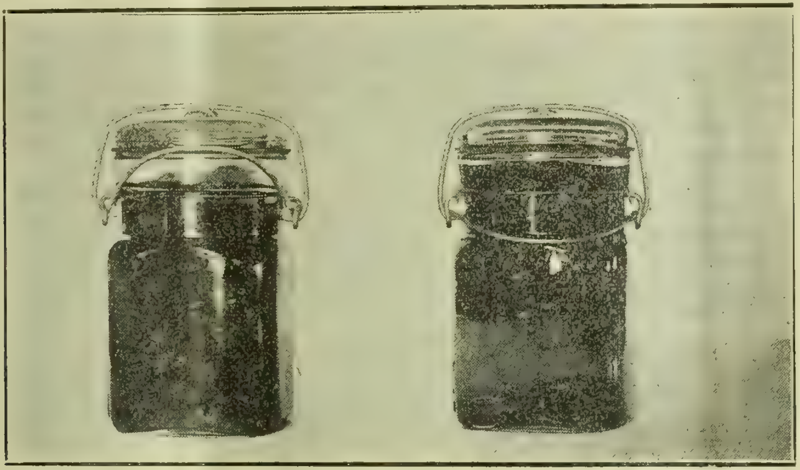


Fig. 2. Showing jar on left ready for first boiling and not tightly sealed. Jar on right sealed tightly after first boiling.

For sterilizing, an ordinary tin clothes boiler fitted with a false bottom made of wooden slats or of perforated tin will be found convenient. If a tin bottom is used it should be raised a few inches from the bottom of boiler, on two small pieces of tin soldered to the inside of the boiler at either end. A few jars at a time may be canned in a granite kettle or pail, fitted with a cover and false bottom.

CANNING FRUIT

Prepare a syrup for the fruit, the density of the syrup depending upon the sweetness required. One measure of sugar to two of water will make a syrup suitable for sweet, slightly acid fruits. More acid fruits will require two measures of sugar to three of water as cherries, berries etc. Plums, quince and tart apples may require equal measures of sugar and water, while very tart fruit as sour plums, gooseberries and currants may require twice as much sugar as water. For large fruits, prepare one pint of syrup for each quart jar—for small fruits, about one-half pint of syrup. Prepare fruit as for stewing. Leave small fruits whole. Prick the plum skins to keep from bursting. Leave peaches whole or cut in halves, and cut pears, quinces and apples in quarters or eighths. Pack fruit lightly in jars and put on the rubber rings. Fill up jars with cooled syrup, cover but do not seal tightly. If using the type of jar illustrated, do not press down spring at side. (See jar on left, Fig. 2) Place jars in boiler, add enough water to have it come up about two inches around the base of jars. Cover boiler and boil ten minutes. Seal jars tightly and boil again from ten to twenty minutes. Boil ten to twenty minutes on the second day and again on the third day, keeping jars tightly sealed and in a warm place, during the twenty-four hours between each boiling. Berries are boiled five minutes before sealing tightly, then ten minutes on the three successive days. All other fruits are boiled ten minutes before sealing. Apples, quinces and hard pears should be boiled fifteen to twenty minutes after sealing, on first day and twenty to thirty minutes on two remaining days. Cherries, plums and peaches are boiled ten minutes the first day and twenty minutes on the second and third days.

CANNING VEGETABLES

The method for vegetables is the same as that for fruit except that a longer boiling is required. Pack vegetables firmly in jar, fill with fresh cold water and add about one-fourth teaspoon salt to every pint jar. Boil 15 mins. before sealing tightly then forty-five minutes the first day and one hour the second and third days.

SPECIAL TREATMENT OF VEGETABLES

Asparagus. Cut stalks of proper length to fill jars. Arrange uniformly with the tips up. More stalks may be put in by forcing three or four into centre of jar tip down.

Beets. Boil until peeling comes off easily. Peel and slice or can whole. Boil forty minutes the first day and fifty minutes the second and third days.

String Beans. Remove strings and cut in inch pieces. Boil five minutes in a pan, then pack in jars.

Corn. Can as soon as gathered. Husk, clean off silk and cut off grains with a sharp knife. Pack firmly.

Peas. Hull and boil five minutes before packing. Pick out those that turn yellow with this cooking.

Tomatoes. Scald and peel. Cut out all hard places, saving juice, that runs out in peeling and cutting, and use it to fill jars. Boil ten minutes before sealing, then twenty minutes the first and thirty minutes the second and third days.

The above times for boiling apply to pint jars. Increase this one and one-half times for quart jars.

K. A. FISHER,
Macdonald College

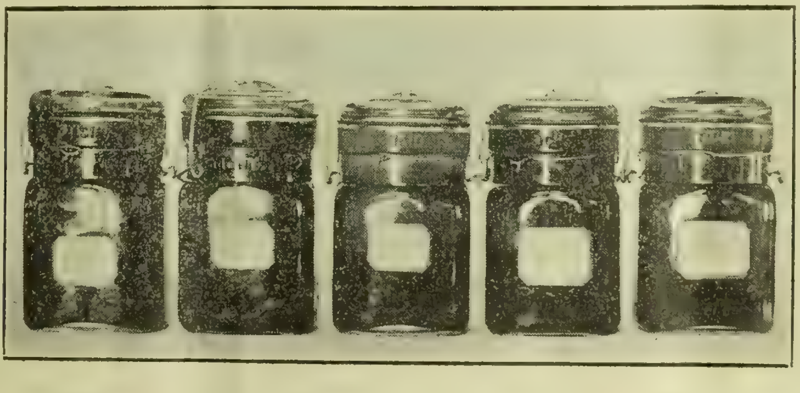


Fig. 3. Uniform jars, clearly labelled, make an attractive looking food cupboard

---

THE COOKERY EXHIBIT AT GRANBY FAIR

THE arrangement of the Cookery Exhibit at this Fair was excellent. The space allotted to this purpose was enclosed from the rest of the large hall by a wood and glass partition on one side, and a door led into it from the hall. Through this door the judge entered and quietly judged the cooking, while the spectators viewed the exhibits and the results of the judge's decision through glass.

Any Fair desiring to improve the arrangement of their cookery section would do well to look over the diagrams given here. Diagram 1 shows the enclosure in its position in the hall: and Diagram 2 shows the inside of the enclosure. Two long shelves in front of the glass partition held the exhibits, those taking prizes being marked and placed in order, and in front of the windows a long table was provided for the judge's use. Both shelves and table were neatly covered with white paper. No time was wasted in collecting apparatus, knives, spoons, tumblers, corkscrew, clean towels, plates, etc.

The arrangement and appearance of the different exhibits were good. The following flour mixtures were entered:—Bread, (white, graham and steamed brown bread), rolls, apple, pumpkin and custard

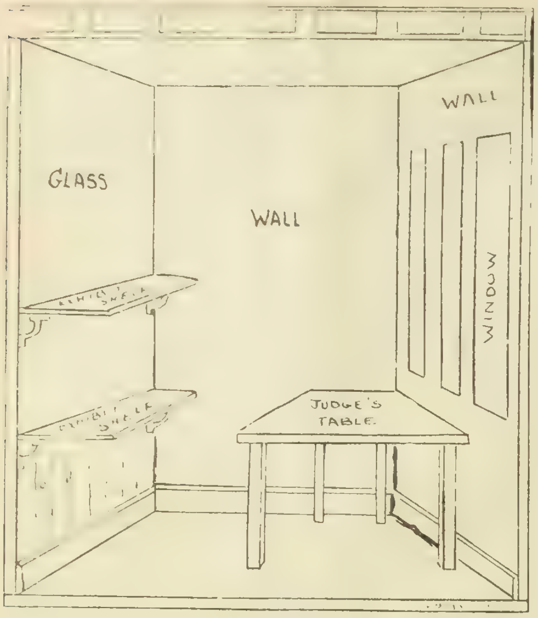


Fig. I. Diagram showing the enclosure

pies, sponge cake, tarts, cookies and doughnuts. The women of Granby certainly deserve to be complimented on their bread and expecially their rolls.

The exhibit of canned fruit was very small indeed. The matter of canning vegetables and fruits at home is an important one. Much of the natural flavour of the product is retained and by the modern method of canning little labour is involved. It is an inexpensive method of preserving food and in no other way would many vegetables find their place on the family table in the late winter and spring months.

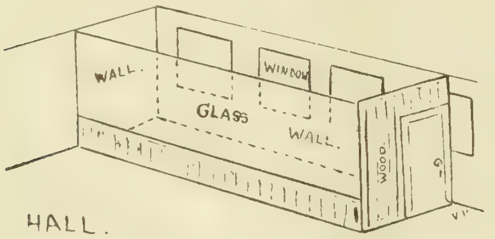


Fig. 2. Enclosure in its Position in the Hall

First, second and third prizes were given at the Granby Fair, and in some cases even fourth and fifth prizes were given. This is certainly encouraging to exhibitors.

E. RUTTER

THE FAIR AT SHERBROOKE

DESPITE cold and uncertain weather the attendance of women at this Fair was very good indeed and the interest manifested in the Housekeeping Department was certainly not behind that of recent years.

In the cookery section the following flour mixtures were entered:—Bread rolls, Graham bread, baking powder biscuit, doughnuts, butter cakes, layer cakes, sponge cake, angel cake, and light and dark fruit cake.

The entry of bread was much smaller, probably partly due to the fact that only one milling company offered prizes this year. The quality of the bread was on the whole better than that of last year. Unfortunately a number of loaves are debarred each year on account of being more than four ounces over or under weight.

Exhibitors should make sure during the year (by experiment) that they have obtained an accurate recipe for a two pound loaf- (i. e. the exact amount of liquid and flour necessary to produce a loaf of 2 lbs.), not forgetting also that a bread pan should not be more than 4 inches in depth.

There were more entries of both angel cake and sponge cake this year and the quality of the angel cake was a distinct improvement on that of recent years, though the first prize was won by the person who has won it for at least five years.

The greatest improvement in the Cookery Department was in the canned fruit and canned vegetable exhibit. The entries were large and the quality was good. Cherries, strawberries, raspberries, pineapple, peaches and pears were represented, and also the following vegetables:— whole ripe tomatoes, young beets, young carrots, green peas, string beans and corn. The "Package"— which includes the jar selected, the labelling, the proportion of fruit to syrup, and the preparation or appearance of the fruit in the jar—was excellent.

Clear glass should always be selected for exhibit purposes whether for liquids, chili sauce, pickles or canned foods.

A jar of canned vegetables should contain as much vegetable as possible but this should not be the case with canned fruits. In some cases the syrup was too heavy but this fault was not general.

Vegetables are canned in sterile water to which a little salt may be added but the use of vinegar even in the smallest amount is not allowable. In three entries of canned vegetables, the vegetables were almost raw and yet the contents showed no sign of spoiling. This the judge found rather puzzling; she would be very grateful for information on the matter. The canned peas were excellent in appearance—of uniform size and of remarkably good colour. An explanation in regard to the method employed for retaining the colour would be much appreciated by the judge in this department.

The "Improved Gem", "Perfect Seal" (or other jars with wire springs) are preferable for canning. The "Crown" jar is not very satisfactory, but may be used for jams, jelly or marmalade.

The exhibit of marmalades and fruit jellies was large and in most cases was of good quality. Housekeepers should guard against boiling a marmalade or jelly mixture after a drop of the liquid will "jell" when dropped on a cold plate. Longer boiling darkens and toughens the jelly.

As in other years there were exhibits of chow-chow, mustard pickles, mixed pickles, chili sauce, jams and raspberry vinegar, all of which were very creditable.

If I were asked in what way improvement could be made in the cookery section at this Fair, I should say:—

1. Either have the judging done before the public are admitted, or bar off a space in which the judge may do her work, allowing at least five feet from the spectators.

2. After the food is judged have it all placed behind glass, canned foods included, as the constant handling of jars upsets the arrangement and spoils the appearance of the exhibit.

Doughnuts, when cold, are a food which is very hard to judge. Ginger snaps or pumpkin pie might perhaps be substituted.

E. RUTTER

SCORE CARDS FOR JUDGES OF COOKING

THE following Score Cards are used by judges of Cooking, from the School of Household Science, Macdonald College:—

SCORE CARD for Bread, Pastry, Cakes, Doughnuts, Baking Powder Bicuits, Rolls, Angel Cake, Fruit Oake.

Texture (or grain)	3
Flavour	3
Colour	2
General Appearance	2
TOTAL	10

SCORE CARD for Canned Goods.

Package	4
Flavour	4
Colour	2
TOTAL	10

SCORE CARD for Jam, Jelly Preserves and Raspberry Vinegar.

Package	1
Consistency	3
Flavour	3
Colour	3
TOTAL	10

SCORE CARD for Home-made Candy.

Package	2
Flavour	3
Texture (or grain)	3
Colour	2
TOTAL	10

SCORE CARD for Pickles.

Crispness	4
Flavour	4
Package	2
TOTAL	10

THE CHILDREN'S HOMER

VIII

AFTER the Trojans had broken through the walls of the Greek camp, there was wild fighting, in which the Greeks were driven ever nearer to their ships, until Patroklos, clad in Achilles's armor, joined in the battle, followed by Achilles's men, the Myrmidons, as fierce and strong as wolves.

Achilles had not lent to Patroklos his spear, for that was too heavy for any but its mighty owner to wield; but all the rest of his armor he had given, and his chariot, drawn by three wonderful horses, two of them immortal, the third hardly less swift than they. Automedon the brave and faithful charioteer, drove the horses and helped Patroklos in the fight.

Achilles made Patroklos promise that once he had driven back the Trojans from the camp, he would return, but Patroklos forgot his promise, and much sorrow came of his forgetting.

When the Trojans saw Achilles and his Myrmidons, as they supposed, many of them were frightened, and fell back at once. Hector, Sarpedon, and other brave princes did their best to rally them, but the fresh, eager Greeks overcame the tired Trojans, and put them to flight.

Patroklos fought with great Sarpedon, and slew him. Sarpedon fell "like a tree cut on the mountain side", and long and hard was the contest for his armor and his body, but the Greeks finally won, and drove the Trojans away.

Then was the time for Patroklos to return, but full of the joy of victory, he bade Automedon pursue at full speed, and under the walls of Troy, Hector turned and attacked him.

Their conflict was short and terrible, and Hector slew Patroklos and spoiled him of his armor, but the Greeks rescued his body, returning with it to their camp.

They hardly dared to tell Achilles what had befallen his friend. Achilles loved Patroklos more than anything in the world; his grief when he saw his dead body almost made him mad. He would not eat nor sleep; he swore that he would pile the bodies of dead Trojans mountain-high in vengeance for Patroklos's death.

Thetis, his Goddess mother, heard him mourning and came to comfort him. She promised him new armor from the forge of Hephaistos, the skilful armor-maker of the gods, that he might be well-armed to avenge his friend.

In one night, Hephaistos made a suit of wonderful armor. He forged a strong and spacious shield, with a silver handle on the back, and all its wide circular space marvelously adorned with scenes from human life,—the earth, the sea, the sky, with sun and moon and stars, a bridal procession, a battle, a court of law, men ploughing

OF GENERAL INTEREST

CANNING—IMPORTANCE OF THE CULTIVATION OF FRUIT AND MEANS FOR ITS DEVELOPMENT

THE Canning Factory of the Cooperative Society of Kamouraska has commenced its operations. Blueberries, tomatoes and prunes are prepared with care under the direction of Mr. D. J. Wood, the new expert engaged by the Department of Agriculture. This officer, who does things methodically and orderly, is quite highly spoken of. Almost all the preserves will be placed in glass jars. This improvement is highly appreciated on all markets and the demand for these products is considerable. The glass jars are preferable to the tin cans which very often change the taste of these fruits especially when they are acid. Let us hope that this new industry so advantageous to our farmere will develop in Kamouraska. To this end the Cooperative Society must realize profits and establish a reserve fund so as to insure its existence and prosperity. Success is hardly possible otherwise. Directors and officers who do not work to obtain revenues exceeding their expenses are misfits, or persons without any clear idea of their responsibility. This policy must be followed in spite of the recriminations of the enemies of the Society, or of narrow-minded persons who do not understand the needs and interests of the Association. The beginnings of such an enterprise are always difficult. The situation must be faced with energy and firmness. If the Society can realize a profit this year, it will be able to continue operations and develop the cultivation of fruits in that region. It should be possible to cultivate and can strawberries, raspberries, blueberries, cherries and plums.

A factory with a good capital might be able to buy all the fruits which that region could produce.

Fruit growing is agreeable and profitable work. It gives employment to children as well as to adults. As soon as every farmer dedicates a little corner of his farm to it, the canning factory will be supplied with all the raw material it requires and the farmer and his family will be profited accordingly.

---

reaping, feasting, harvesting grapes, and making wine, dancing,—all, with exquisite skill, Hephaistos carved, with gold, and tin and brass, on this famous shield of Achilles. And he made a helmet with a plume of gold.

With this armor, Achilles went to avenge Patroklos, and nothing could stand before the fierceness of his wrath. Even brave Hector fled at first, and then, when he turned to fight with the courage that belonged to his character, Achilles slew him suddenly, and tying the beautiful body to his chariot wheels, dragged it in the dust, three times around the walls of Troy. The Trojans were heartbroken with the shame and sorrow of it, and Priam and Andromache knew at last the grief and terror they had dreaded so long.

So Troy mourned, while the Greeks rejoiced and planned games and athletic contests to honour the burial of Patroklos.

Priam could not bear to have his son's body so dishonored, and resolved to go himself and beg of Achilles to give it back to him. With just a few old men, and bearing rich gifts, the sad old king came to the tent of Achilles, and Achilles, terrible though he was in anger, yet was generous and warm-hearted and pitied the grief of Priam. He received him with courtesy, and granted his request. Hector's body was washed and robed in fine purple clothing, as was due to a king's son and a hero, and restored to the Trojans for honourable burial. So while the Greeks held the funeral rites of Patroklos, in Troy the same solemn rites were being held for Hector.

……

Here Homer's story of the Iliad ends, but I will tell you next time how the fight for Helen was finished, as we know from other stories of those long-ago days.

Note: Passages quoted in this series are from Chapman's Homer.

MARGARET GRAY

HEREDITY AS AN INFLUENCE IN MILK PRODUCTION

by Prof. H. Barton

(Continued from our September issue).

STUDY OF CANADIAN RECORDS

FROM our own Canadian records I have made a few compilations, and while they are not extensive and hardly as representative as we should like, they are again at least suggestive and much in accord with the American records in what they show. They are beginning to give us results, and every dairy-cattle man will do well to be a student of records.

Like the American records, no doubt various individual records will have individual factors to explain them, the cow's development, the bull, etc., but numbers will tend to minimize the influence of the exceptional factor, and in any case will give us an average. That is as far as we can go at the present time, and surely that distance is worth going; it is the basis of every rule after all.

In the last two volumes, IX. and X., of the Can. Hol. Fr. R.O.M., there are 112 new records (additional not included). Ninety-one of them, or 80.3% show recorded ancestry in R.O.M., or within the second generation. Twenty-five of them, or 22.3%, have both sires and dams recorded. Forty-two of them, or 37.5%, have either sire or dam recorded.

In volume X. there are 190 new records (additional not included). One hundred and seventy-seven have recorded ancestry—93.1%. Sixty-four have both sires and dams recorded—33.6%. Seventy-three have either sire or dams recorded—38.4%.

A man may enter as many cows as he likes from one year to another, and there is no doubt a tendency for a man to enter as many as he can. This increased percentage of cows, however, with recorded ancestry from one volume to another is not due to the fact that the same men entered a larger number each year, in which event naturally we might expect they would be bred from recorded ancestry.

A compilation of the breeders clears this up:—

Vol. IX.—112 records includes 56 breeders—average 2 records for each breeder.

Vol. X.—177 records includes 81 breeders—average 2.3 records for each breeder.

—

25 new breeders.

No doubt good cows untried are numerous which could make records—but this also is true—25 new breeders is quite an exploring force, and, moreover, the men with record cows are live wires, and in my observation are not slow to explore either, so that capable outside cows should have fair representation.

ALL HEIFERS UNDER 3 YEARS OF AGE

120 *New Records.*

101 with recorded ancestry or	92.5%—7.5%
40 with both sires and dams	33.3%
15 sires alone or	12.5%
26 dams alone, or	24.1%

If the standard is raised to 12 lbs. fat and over we find that the percentage decreases somewhat, no doubt due to the small number, only 18, and the fact that heifers without record ancestry are not likely to be entered unless they promise something really good, and while these are few there are enough of them to materially influence the percentage.

Going farther we have a few 17 and 18 lb. heifers, but all of them, or 100%, have record ancestry. On the face of this evidence it seems fair to conclude that record cows are breeding record cows, and while it could hardly be taken to mean that out of every hundred cows tried 92% of those that qualify would have record ancestry within the second generation and eight would have none, our chances of breeding record-making cows and bulls, particularly of the phenomenal class, are certainly best when we mate animals of record of merit standing. The seven-day test is frequently criticised, and while most of us will agree that it cannot furnish as much information as a thirty-day test, and while I prefer a thirty-day test to a seven-day test, I much prefer a yearly test to either of them, and again a five-yearly test to one of twenty months. In other words, the larger and more complete the record, unquestionably the more reliable and representative it is. This we must admit, however: the evidence as we are now obtaining it justifies the existence of the seven-day test for the purpose for which it was intended. It has done much to advance the breed and is serving as an effective guide in directing breeding operations. This little evidence is only a fringe of what will be available in reference to many factors in a short time, but if I have succeeded in interesting some of you to study what and how cows are breeding I shall not feel that I have been too much of an imposition.

Before sitting down, however, I want to touch on the matter of pedigree, and its interpretation, as a guide to what we may expect in transmission. As already intimated, our policy must be one of selection. The biologist is hard at work, and already has done wonders with plants, apart from mass selection, as he calls it. He has discovered that a certain law is at work which he can lay hold of and actually create and combine with control, for selection. There is evidence to show that these Mendelian principles, as they are called, are at work in stock breeding as well, but outside of one or two excellent guides they afford us, their operation in stock breeding must still remain in the biologist's hands. Much time and great numbers are required, with especially such difficult and complicated characters as milk production includes. Our forte must therefore be intelligent combination and selection.

Before we can interpret a pedigree we must be able to value the animals that appear. Records will help us to do this. Given that we are familiar with the value of the different animals that appear, how shall we estimate their influence from one generation to another? Without going into detail, I wish to draw your attention to a law that has been formulated after a careful study of a large number of cases, including humans, and while like other laws in this work it represents the average, it must necessarily carry us in the long run, and we shall do well to employ it as a guide in our study of pedigree.

Briefly put, this law tells us that the influence of the various generations is:— First, or parents, 50%, each ¼ influence; second, or grandparents, 25%, each 1-16 influence; third, or great grandparents, 12.5%, each 1-64 influence; fourth, or great great grandparents, 6.25%, each 1-256 influence.

The information in this for a breeder of dairy cattle is that, first, all ancestors count, and the further back he can go with good ancestry and without a scrub the better is his pedigree; and second, if any weakness is to be tolerated in a pedigree the more remote it is the better. We may have exceptions, but if an animal has a long line of ancestors uniform throughout we have the best guarantee possible of a favorable result.

SHEEP AND SWINE AT SHERBROOKE

IN numbers as well as excellence of individuals the exhibit of sheep at the Eastern exhibition this year surpassed previous records. Individuals from the best flocks in Ontario as well as those of Quebec were lined up to compete for the blue ribbons. All the classes were filled to overflowing and many excellent sheep owing to the keenness of competition were returned to their pens without a prize.

The numbers shown and the general excellence of individual breed type prevailing throughout, as well as the skill and care which was necessary to bring these sheep out in the pink of show condition, are evidences of the returning interest in sheep husbandry throughout the Province of Quebec.

In the medium-wooled breeds the Hampshires were particularly strong especially in the aged and shearling classes, and as a whole exhibited abundance of character. The Shropshires were again out in full force and came in for a good deal of admiration from visitors at the fair. The Southdowns though lacking somewhat in numbers were highly representative of the breed. The Oxford Downs were strong in their classes throughout and as a breed were perhaps as fully represented as any. In Cheviots there were some excellent individuals and this breed seems to be gaining prominence.

In the long-wooled breeds the Leicesters and Cotswolds were particularly strong making the competition extremely keen. The Lincolns were also out in their usual numbers.

A new feature of the sheep department this year was the exhibit of Cheviot sheep from Macdonald College including representatives from the extension flocks of Mr. E. N. Chaddock and W. J. Parnell, as well as from the flock at Macdonald College. The exhibit comprised eighteen sheep in all consisting of ewes, ewe lambs and ram lambs. The object of this exhibit was to bring the sheep raisers of the province closer into touch with the extension work at Macdonald College.

SWINE

The exhibit of swine was again up to the usual order of merit. The bacon classes were well filled especially those of the Yorkshires which were an exceptionally fine lot throughout. The Tamworths though fewer in numbers were by no means lacking in merit.

In the fat classes as usual the Chester Whites had prominence over other breeds in number of entries. In Berkshires Mr. Martin had the field to himself. Mr. Miller has an excellent herd of Chester Whites and Mr. McCulloch is to be commended on his Yorkshires.

A. A. MAC M.

OUR LADS TO THE FRONT

Agnès Maule Machar (Fidelis)

No foe besets our gates.
No armies meet our ken;
Why echoes through our peaceful streets
The tread of armed men?
Why rings the British cheer
With such a proud acclaim?
The "true North" sends her sons afar
To fight in Britain's name.

They go, as went their sires of old,
Across the surging seas to fare,
Not for the lust of fame or gold,
But for the British hearts they bear!
They hear the mother land, afar,
Calling her children, scattered wide;
They haste, as wakes the note of war,
To face the conflict at her side!

We follow, with our thoughts and prayers,
The richly freighted vessels' wake;
Through blinding fogs and hidden snares,
Winds! bear them safely, for our sake.
They hold the hopes of hearts that bleed
With parting pangs, with nameless fears;
Their devious course in safety speed,
Thou who must guide where duty steers.

What years of peace essayed to do
Danger and sorrow swift complete—
Unite our Empire through and through,
Till, with one throb, its pulses beat!
One prayer is breathed on sea and land,
From King and peasant, cot and hall,
From snow-capped hills to coral strand,
God guard our lads, and bless them all!

Oh God of Justice, Truth and Right,
Who seeth as no mortal may—
Whose hands can guide through passion's night
To dawning of a glorious day!
Grant victory as Thou deemest best;
Turn hate to love, bid slaughter cease,
Lay sword in sheath and lance in rest,
And bring our warriors home in peace!

No foe besets our gates,
No armies meet our ken!
Yet echoes through our peaceful streets
The tramp of marching men!
Ring out the British cheer
With more than proud acclaim!
The "true North" sends her sons afar
To fight in Freedom's name!

THE FARMER'S WIFE

WE shall never check the drift of population from country to town, that characterizes all the English speaking races, until it is driven home to us that the farmer, besides live stock of various kinds, and children of various ages, has a wife. Until we make life on the farm satisfying to the farmer's wife, we shall labor in vain to check the drift of rural population to the towns and cities.

The farmer's wife is really the best thing on the farm. She works more hours than any laborer in the city or town, more hours than the hardest driven lawyer or doctor. In addition to this, she is the mother of the farmer's children. She really has the biggest place on the farm. Often, when accident or death lays the farmer low, the wife takes hold of the farm and manages it, sometimes succeeding better even than her husband did. If it were not for her thrift, her ability to make a little go a long way and to get a large part of the living of the family off the farm in the shape of vegetables, butter and eggs, a good many farmers would have broken up long ago. She is the person on the farm who can least be spared, and the hardest person for whom to find a substitute.

Why should we not make the life of this hard-worked farmer's wife as comfortable as possible and farm life for her as satisfactory as possible? There is one thing greatly in our favor in this attempt. She loves her children, She fears the dangers of bad companions to her children. She dreads the foul-mouthed boy, and the foolish or silly and uncouth girl. She knows there is less danger in the country to her brood, for which she would give her life at any time, than in the city. Hence her inclinations naturally lead her to prefer the country. Why should we take advantage of this mother-love by asking her to do things that there is no need of her doing? For example, when the farmer installs a water system on the farm, why should she not have one in the house? When he puts tank heaters in his water tank to take the chill off the water for his live stock, why not have hot and cold water in the house? Why should she churn when it is possible to organize a creamery? Why, after the creamery is organized, should she do her own washing, and often that of hired hands as well, when it is possible to operate a cooperative laundry in connection with the creamery? Why should she wear out her life in a poorly constructed house, where two steps are necessary where one should be enough? Why should she have to go around and pick up after husband and children, when it would be a great deal better for them to pick up after themselves, thus training them to habits of neatness to take into their own homes later on?

Why should not the farmer's wife be encouraged to have her club, her church society? She loves her husband, she loves her boy; but no woman is entirely satisfied unless she has from time to time the companionship of women outside her own immediate family.

If we are to make the home happy and farm life satisfactory and worth while, we must consider the farmer's wife, and inquire in what way mere man, naturally stupid, can add to her comfort. No amount of study will ever enable us to do that, because men don't understand women and women's ways of looking at things. "Himself" (to use an Irish term) will simply have to ask "herself," and let "herself" tell "himself" what "herself" wants. Then let "himself" proceed to do it.

Give the farmer's wife a chance to go to church. There are five times (at least) as many religious germs per cubic centimeter in her system as in the system of the farmer. Give her an opportunity to develop her religious instinct naturally. We sometimes fear that some farmers buy automobiles before they are quite ready to; but when they tell us they are buying one for the sake of the wife, we give up at once and say: "Buy two". The field of human vision in the country is measured by an hour's journey by whatever means of travel may be available. It was very limited where we had to walk, not over two or three miles. When we got a good trotting horse, it stretched out to ten miles. The automobile has extended it to twenty. There is nothing else that tends to remove the isolation of the farmer's wife as the automobile does when wisely used. When simply used to go to town, that use becomes an abuse where the trip is unnecessary; but if used to get acquainted with the country and its people, to enable the farmer's wife to attend her club, her church and church society, then it becomes a blessing.

Let the farmer remember that he has on his farm not merely grain and live stock, but a wife, and that she is the most valuable asset on the place.

Wallaces' Farmer

THE ISOLATION OF FARM LIFE

THE greatest drawback of farm life and at the same time its greatest advantage, it its isolation. These are pretty widely separated but a little thought will bring out the reason why both are true. By stress of circumstances a farmer labors largely alone, he does not mingle with his fellows in the close companionship of the shop or office. When he seeks companionship other than that of his own home, he has some distance to go and it is more of an effort than in the city.

Yet this very isolation, and there is a good deal of shallow writing and thinking on this subject, may work to his own salvation. How many a city man, with all his varied interests and many interruptions, does not find the time to read and study. The semi-isolation of the farm makes it possible to read more and better; a man has time to think. It is for this reason that our best thinkers are generally country raised.

(To be continued)

The JOURNAL of AGRICULTURE

AND HORTICULTURE

Volume 18 *November 1st 1914* *Number 5*

THE HARVESTING AND SELECTION OF SEED ROOTS.

(Photo by Boving)

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

REPEATING RIFLES
High Power

Solid Breech
Hammerless Safe

THE things that distinguish Remington-UMC Big Game Rifles from all others of their class are certain fundamental refinements invented and used exclusively by the Remington Arms-Union Metallic Cartridge Company.

The famous Remington-UMC *Slide Action* features; Six Shot; Hammerless; 22 inch Ordnance Steel Barrel; patented quick-adjustable Straight Bar Rear Sight and new design Copper Bead Front Sight. Chambered for .25 Rem., .30 Rem. and .32 Rem. cartridges.

Look for the dealer who displays the *Red Ball Mark of Remington-UMC.* He has these Remington-UMC Rifles in stock now, or he can get them for you.

To keep your gun cleaned and lubricated *right*, use Rem Oil the new powder solvent, rust preventative, and gun lubricant.

REMINGTON ARMS-UNION METALLIC CARTRIDGE CO., Windsor, Ontario

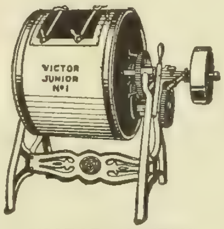
DE LAVAL
Dairy Equipment
Insures a Better Product

THE De Laval Line of Dairy, Creamery and Farm Supplies insures a higher grade product, more economical operation, and better prices.

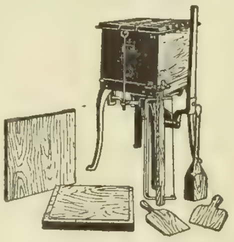
Milk dealers, creamery men, cheese makers and dairy farmers must have modern equipment of the very best grade in order to operate to the best advantage and secure the greatest margin of profit.

The De Laval Line of Dairy Supplies is by far the largest and most complete in Canada. Only equipment and supplies of the highest grade are carried. Successful dairymen know that this is the only kind they can afford to buy.

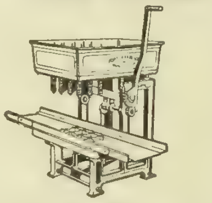
We issue complete catalogs of each line. Any or all of these mailed upon request.



VICTOR CHURNS



BUTTER PRINTERS



BOTTLE FILLERS

DE LAVAL DAIRY SUPPLY CO., Ltd.
LARGEST MANUFACTURERS OF DAIRY SUPPLIES IN CANADA
Exclusive Canadian distributors of the "World Standard" De Laval Cream Separators
PETERBORO MONTREAL WINNIPEG VANCOUVER

ALL LIGHTED FROM ONE PRESSURE TANK LIKE GAS
can do this once a week and supply light for every room in the house

"SUN" Hollow Wire System

is a **luxury**, and a **necessity** to every home: **A luxury**, because money can't buy a **better** light, soft, brilliant, beautifying, restful to the eyes. **A necessity**, because it is the cheapest of all lights, the **most** light for the **least** money, as well as clean, convenient and labor saving. Lamps all lighted from one gasoline tank, which may be in the cellar or attic, inside or outside the house. Anyone can install it; a child can operate it. **Gravity lamps also. "Sun" Lamps** are made in one, two, three and four-burner fixtures; over 100 styles for all indoor lighting. Send for complete catalog, special terms to agents and details of our SPECIAL PREMIUM OFFER. Beautiful NEW EASTMAN KODAK (No. 3 Premo Jr., photos 3¼ x 4¼) FREE to every purchaser of $24 worth of lamps in one year.

SUN LIGHT CO., 1520 Market Street, Canton, O.

---umm !
Griddle Cakes

and CROWN BRAND
CORN SYRUP

Children and grown-ups everywhere love this delightful and wholesome syrup.

Cakes never taste so good as with CROWN BRAND CORN SYRUP. It has a distinctive flavor — all its own.

For those favorite home-made candies that are so good and so much fun to make—always use CROWN BRAND CORN SYRUP.

So Delicious ! Economical too !

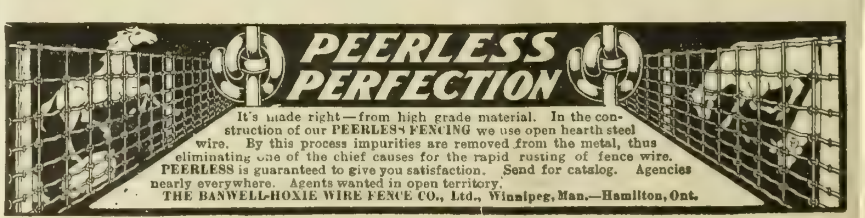
Made in Canada
Sold by all Grocers

Write for the Edwardsburg Free Recipe Book.

The Canada Starch Co.
Limited

Makers of the Famous Edwardsburg Brands (Benson's Prepared Corn—Silver Gloss Laundry Starch—Lily White Syrup—Etc.)

MONTREAL CARDINAL TORONTO BRANTFORD
FORT WILLIAM VANCOUVER



PEERLESS PERFECTION

It's made right—from high grade material. In the construction of our **PEERLESS FENCING** we use open hearth steel wire. By this process impurities are removed from the metal, thus eliminating one of the chief causes for the rapid rusting of fence wire. **PEERLESS** is guaranteed to give you satisfaction. Send for catalog. Agencies nearly everywhere. Agents wanted in open territory.

THE BANWELL-HOXIE WIRE FENCE CO., Ltd., Winnipeg, Man.—Hamilton, Ont.

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE
AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 101,835
FRENCH, 92,275
ENGLISH, 9,560

Volume 18

NOVEMBER 1st 1914

Number 5

EDITORIAL

THE UNEMPLOYED ON FARMS

IN our last issue an appeal was made to our readers to write us regarding the practicability of using unemployed from the cities on the farms during the coming winter, spring and summer months. The response to our appeal has been very meagre. It is doubtful, however, if this lack of response means that the farmers cannot use to their own advantage men, even married men and their wives, on their farms.

On the other hand, we have heard that men, accustomed to farm work, are wanted in some districts. It would be a pity if farmers desiring help cannot get it when there are capable persons out of work. It is to be hoped that the farmers will make their needs known as soon as possible, so that some organization may be formed whereby they may get into direct touch with those seeking employment. We have already forwarded the names of three or four farmers who want help.

INCREASE OUR FARM PRODUCTION

THE farmers of Canada have an excellent opportunity of helping the Empire in this supreme crisis of her history. The present check-mate condition of the armies cannot last long; exhaustion of resources, especially food supplies on one side will give the advantage and ultimate victory to the other side. Great Britain, we know, is largely dependent on other countries for her food-supply, and as long as the British Navy commands the seas, she will be able to get this supply. But Russia will be unable to send her wheat this year or the next, consequently it is the duty of our Canadian farmers to do their utmost to make up, in part at least, the deficiency from that and other countries.

Our farmers should not only prepare and sow a larger acreage of wheat, but also arrange to rear more live stock so as to have a larger number of beef animals, swine and sheep for export. We might well follow the example of Germany which has prohibited the killing of young stock under 150 lbs. weight.

To all appearances the war will be a long one, and the farmers of Canada can strengthen Britain's hand by keeping her well supplied with foodstuffs.

RURAL SCHOOL FAIRS

SPACE has been cheerfully given in the "Journal of Agriculture" for reports of several Rural School Fairs held recently in this province, for we earnestly believe that these competitions are among the most valuable agencies employed at the present time for the promotion of better agriculture.

They aim to interest the boys and girls on the farms by telling them to do things for themselves, under supervision. In rearing chickens, growing vegetables and flowers, selecting good specimens of varieties of apples, making weed collections etc. good enough to compare with their neighbours', the young people are learning valuable lessons which will fit them better for rural life later on.

If the boys and girls can develop an interest in simple farm operations, there is little fear that they will leave the country for the city and be satisfied with the artifical conditions there. By means of the Rural School Fairs the children are encouraged to do things well; they feel that they have responsibilities which they must carry to a successful issue; and more than these, they feel that they are proprietors in a small way and are in partnership with their parents on the farm. By giving persons large interests when they are young character is developed which is maintained throughout their lives.

The County Demonstrators and those assisting them are to be congratulated on the success of the Fairs this year.

SUBSTANTIAL PROGRESS IN DAIRYING

IN his annual report for the year ending March 31st 1914, Mr. J. A. Ruddick, Dairy and Cold Storage Commissioner, makes some significant comparisons between the Census figures for 1911 and those for 1901. The increase in the number of cows in the Dominion in the decade amounted to only seven per cent and was confined to the four western provinces. But the yield of milk per cow increased from 2850 pounds in 1900 to 3805 pounds in 1910. In other words, the production of the average Canadian cow in 1910 was one third greater than the production of the average cow in 1900. The combined effect of the small increase in the number of cows and the large increase in the average yield per cow was a total increase of 43 per cent in the production of milk and one of 64 per cent in the value of all dairy products.

These figures are decidedly encouraging to our dairymen and to all those interested in the development of the dairy industry. Not only has the advance in production been a very substantial one, but it has been accomplished in a decidedly economical manner and has no doubt resulted in a distinct improvement in the type of cattle to be found on our dairy farms. The economy is apparent when we reflect that if the average yield per cow had not increased it would have been necessary to feed and care for more than a million additional cows to accomplish the increase of 43 per cent in total production. This increase has actually been accomplished with the help of only 185,000 extra cows—thanks to the improved performance of the average cow.

We have said that these figures are encouraging, but we cannot by any means say that they are figures for our dairymen to be proud of. A country which lays claim to distinction on account of its agriculture might reasonably be expected to have more than one dairy cow per three persons, and a herd with an average yield of only 3805 pounds of milk would be looked upon by any expert dairy farmer with a feeling of contempt. That those who are progressive enough to have their cows regularly tested are doing better than the "indifferent farmer" is evidenced by the fact given in Mr C. F. Whitley's interesting appendix to the Dairy Commissioner's report that the nearly ten thousand cows tested for the full period of lactition during 1913 yielded an average of 5,273 lbs of milk—nearly 39 per cent more than the census average for 1910. If the average cow did as well as the average *tested* cow we should have a further increase of 39 per cent in production without any increase in the number of cows.

The manufacture of cheese in Canada has declined and we are actually importing butter from New Zealand. Prices have improved, home consumption has greatly increased, prospects are good, and there is every inducement to the dairymen to increase his output by keeping more and better cows.

THE LONG WINTER EVENINGS

THE near approach of the long winter evenings should make our readers ponder carefully on the use they intend to make of them. Our summers are short and full of work with but little time for that kind of reading and discussion that makes for improvement and progress. The evenings of our winter months, on the other hand, are long, and the amount of work to be done on the farm considerably reduced. Some of these evenings every week ought, then, to be set aside for careful reading not only of the agricultural bulletins that have piled up during the busy summer days, but also of the agricultural papers that often contain valuable information relating to all departments of farm work. It would be an excellent plan for the farmers and their sons of a neighborhood to meet, say once a week, for the purpose of discussing special articles in the bulletins and agricultural papers. The best man should be selected as leader or chairman of the meetings, and his duty would be to draw out discussion and direct it along proper channels. Occasionally an outside speaker might be introduced to advantage. The Farmers' Clubs could do most telling work along this line if they so desired.

In these days the man who is informed as to the latest improvements, and who is able to apply this information properly, is the man who will succeed. The educated farmer is showing up splendidly everywhere. The day of muscle and manure alone is past, and brains count in the making of good farmers.

CONTENTS

EDITORIAL.—The Unemployed on Farms; Increase our Farm Production; Rural School Fairs; Substantial Progress in Dairying; The Long Winter Evenings; the Causes of the War; Labour on the Farm; A Rural Survey of Huron County; War Prices in Canada; Report of the Commission on Technical Education; Council of Agriculture of the Province of Quebec.

ORCHARD AND GARDEN.—Storage of Vegetables; Seasonable Notes on Floriculture; Wax Rendering; Supplies of Farm and Garden Seeds.

FARM AND FARM CROPS.—Annual Report of the Minister of Agriculture, Ottawa; Ancient Advice for Farmers; Condition of the Crops; Visit to Macdonald College; Red Clover Seed Production; Root Seed Production; Water Supply for a House; Pumping Water from Well to Kitchen; the Tide and the Flowing Well; Hemp Nettle; Judges of Field Competition Crops in Training.

LIVE STOCK.—Care of the Ewe and Lamb; Fall Hints to the Sheep Breeder; Fifth Annual Sale of the Stock Breeders' Association; Do not neglect the Young Calf; Durable and Sanitary Feeding Troughs of Concrete; Uniform Scale of Points showing excellence in Ayrshire Cattle; The Live Stock Buildings at the Panama Pacific International Exposition.

DAIRY.—List of Prizes obtained for Butter at the Ottawa Exhibition; Whey used in the preparation of Sausages.

POULTRY. — Short Course in Poultry Husbandry at Macdonald College; A Word to Poultry Keepers; Howick School Fair; Ottawa County holds successful School Fairs; Cowansville Rural School Fair; Aylmer School Fair.

WOMAN'S WORLD.—Steadman Homemakers' Club ; Homemakers' Clubs in Compton County; Homemakers' Clubs in Pontiac County; Household Science Extension work in Pontiac County; Foods and Food Preparation; the Children's Homer; Mistress Mary Shakespeare and her Famous Son.

GENERAL INTEREST.—For All we have and are; The Isolation of Farm Life; Inefficient Use of Horse Labour; National Co-operative Farm Accounting; Effect of the War on Fertilisers; Three Reasons for Live Stock; The Stockman of the Future; Management of the Fall Litter; Wanted—Parental Sympathy; Trees and Lightning; Queer Replies by Farm Students; Justice for the County School.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

THE CAUSES OF THE WAR

WAR news is read first during this trying crisis when Europe is ablaze and the British Empire is in peril. Earl Roberts in a message to the Children of the Empire puts very simply and plainly the reasons why Britain is engaged in the war. He says: "Children of the Empire, this is why we are at war: to hold our promise (towards Belgium), to help our friends, and to keep the Flag of Liberty flying not only over our own Empire, but over the whole world".

When we ask ourselves why the Germans went to war we are confronted with many conflicting opinions. They themselves maintain that the present Allies were jealous of Germany's great commercial growth and world influence in recent years, and were only awaiting a favourable opportunity to humble her and get back lost provinces.

An interesting side-light on Germany's aims and attitude is presented in von Bernhardi's "Germany and the Next War", published in 1911, and widely circulated. The author belongs to the military party and no doubt voices the opinions of that party.

It will be seen from this work that Germany had long prepared for war, and had for many years preached and taught doctrines which would inevitably lead to war. It is true that von Bernhardi belongs to the military caste, but it must be remembered that the military caste of Germany dictates her policy. Here are some of the doctrines set forth in the book, and for many years taught in German schools. It will be clear that the present war was not an accident but a determined policy of the Germans.

* * * "War is in itself a good thing. It is a biological necessity of the first importance". (P. 18).

* * * "The inevitableness, the idealism, the blessing of war as an indispensable and stimulating law of development must be repeatedly emphasized". (P. 37).

* * * "War is the greatest factor in the furtherance of culture and power. Efforts to secure peace are extraordinarily detrimental as soon as they influence politics". (P.28).

* * * "Fortunately these efforts can never attain their ultimate objects in a world bristling with arms, where healthy egotism still directs the policy of most countries. God will see to it, says Treitschke, that war always recurs as a drastic medicine for the human race". (P. 36).

* * * "Efforts directed toward the abolition of war are not only foolish, but absolutely immoral, and must be stigmatized as unworthy of the human race". (P. 34).

* * * "Courts of arbitration are pernicious delusions. The whole idea represents a presumptuous encroachment on natural laws of development, which can only lead to the most disastrous consequences for humanity generally". (P. 34).

* * * "The maintenance of peace never can be or may be the goal of a policy. (P. 25).

* * * "Efforts for peace would, if they attained their goal, lead to general degeneration, as happens everywhere in nature where the struggle for existence is eliminated". (P. 35).

* * * "Huge armaments are in themselves desirable. They are the most necessary precondition of our national health". (P. 11).

* * * "The end all and be all of a State is power, and he who is not man enough to look this truth in the face should not meddle with politics " (quoted from Treitschke's "Politik").

* * * "The State's highest moral duty is to increase its power". (PP. 45-6).

* * * "The State is justified in making conquests whenever its own advantage seems to require additional territory". (P. 46).

* * * "Self-preservation is the State's highest ideal and justifies whatever action it may take if that action be conducive to that end. The State is the sole judge of the morality of its own action. It is in fact above morality, or, in other words, whatever is necessary is moral. Recognized rights (i. e., treaty rights) are never absolute rights; they are of human origin, and, therefore, imperfect and variable. There are conditions in which they do not correspond to the actual truth of things. In this case infringement of the right appears morally justified". (P. 49).

* * * "In fact, the State is a law unto itself. Weak nations have not the same right to live as powerful and vigorous nations". (P. 34).

* * * "Any action in favor of collective humanity outside the limits of the State and nationallity is impossible". (P. 25).

LABOR ON THE FARM

IT has been truly said that the two fundamentals in farming are to make the soil produce abundantly with the least labor, and to market the product in the most useful form at the least expenditure of labor. It will be seen, therefore, that the employment of labor to the best advantage plays a most important part in successful farming. This is no new factor, just recently discovered; ever since the race became farmers it has been recognised that good farming consists in the intelligent application of labor to the soil and its products.

However trite and self-evident this principle may appear, in practice it has not been carried out to the extent we should naturally expect. Labor has been stinted to such an extent on many farms in this new country that soils originally rich have become depleted of their richness. The tendency has been to apply less labor and to depend more upon Nature's bounty, but this means further soil depletion. The presence of so many weeds in our fields points clearly to the necessity for increased expenditure of labor.

The great problem of the farmer is then to increase the productivity of his land by improvement of the soil. He will find this no easy task, for the farm practices which were once successful can no longer be employed. More and better cultivation is required, which in turn requires more labor. Most lands require drainage, and this too requires labor. More clover and live stock should be grown and kept to provide for the improvement of the soil by the addition of humus, and this also demands labor. Much labor however is now expended every year with very small returns because expended upon wet or poor soil.

But labor is both scarce and dear, we are told. Labor is always dear when expended, as it is often done, under poor conditions. However, the fact remains that more labor must be employed if profitable crop production is to be maintained. At this juncture when many men are out of work in the cities through the closing down of industries on account of the war, capable farm help should be readily secured at reasonable rates.

It seems to us then that this is an opportune time for farmers to get the necessary help for making the much needed improvements on their farms. If the fertility of the soil is kept up, good profit will be made with wise financial management. The longer our farms are tilled the more attention must be paid to the maintenance of their fertility.

A RURAL SURVEY OF HURON COUNTY, ONTARIO

FOR many years we have been urging the making of rural surveys. We believe that before a consistent, progressive rural policy can be carried out the actual conditions should be first ascertained. One of the first duties of a County Demonstrator should be to make a survey, or stock-taking, of the district in which he proposes to work. Such a survey when made would be most valuable, not only to him but also to the man who succeeds him.

There are several kinds of farm surveys. We have orchard surveys, soil surveys, live-stock surveys, general farm-condition surveys, etc., which have been carried out in Ontario and in several of the states to the South. These have proven of great service in defining the plans for future improvement.

Another survey has recently been made in Huron County, one of the finest districts in Western Ontario, by the Churches. The Report is a valuable document, and any person interested in the work may secure a copy for 15 cents from Rev. S. F. Sharp, Secretary, Huron Survey Committee, Toronto. Some idea of its contents may be obtained from the titles of the Sections:—1. Religious Conditions in Huron Co.; 2. The Young People; 3. Religious Education; 4. The Public Schools in Huron Co.; 5. Farm Conditions; 6. The Survey Exhibit.

The findings of the Committee make valuable reading, as the conditions in Huron County do not differ much from those obtaining in many sections in our own Province. We shall quote them.

"In the survey the aim has been to ascertain and display the facts, present the actual conditions, bring into high relief the most striking features, whether good or bad, and make clear a programme or policy for the future. It is hoped that the three following points will stand out with the utmost clearness and emphasis:

"The first is, the supreme importance of the development, in children and young people, of the highest character through education and training.

"The second is, that no one institution or movement will solve the country problem, but that all forces must unite and co-operate for that end. Much can be done through the public school; much through farmers' organizations; much through Governmental action, as in a progressive immigration policy or tariff reform; much through the Church; but no one alone is sufficient. All must work together, each making up what is lacking in the others.

"Third, that, from its natural position of leadership, its trained and educated ministry, its complete organization, its close and constant touch with the people, its non-partisan character, its moral and spiritual appeal, and its unifying bond, the Church is the organization that is best qualified to lead in the rehabilitation of the country. The opportunity offers. If the Church responds a great advance will be made; if the Church fails the loss will be irreparable."

Keeping the People on the Farm

The problem of keeping the people on the farm is complex, but the following will help solve it:

1. Education in the country for the country boy and girl, so that they can get just as good an education as in the city. It should be broad, yet distinctly rural and agricultural, and to be had in their own township.
2. Co-operation in production and marketing, that the farmer may receive true market value, and a rightful price for all that he produces.
3. Co-operation in social and religious life, that the moral tone of the people may be true to the best teaching of home, church and school.
4. Leadership by men who are willing to sacrifice time, money and energy to bring into active life the principles of true democracy. Then each community will produce its own leaders.

WAR PRICES IN CANADA

THE effects of two months of the world's war on Canadian Prices are summed up in a rise of the Labour Department's index number from 135.5 as calculated at the end of July to 140.7 as worked out at the end of September. These numbers are percentages of the general level of prices in the decade 1890-1899 and are based on quotations from 272 articles scattered over the whole field of production and consumption.

Most of the rise took place during the three weeks following the declaration of war. In fact the last half of September saw general steadiness and even a tendency to decline in important articles like grains and cattle.

Though a rise of 5 points in the Department index number is very marked it is not without precedent. Canadian prices during the trade boom of 1912 went up at intervals with almost equal rapidity, and the readjustment of prices at the close of 1911 sent the index number up 4 points in a single month.

It has also to be remembered that several articles which have contributed very materially to sending the index number up during the last month are not of first importance in consumption. For example, cream of tartar, antimony, and quicksilver have all more than doubled, while a number of other secondary commodities (alcohol, solder, sulphur, etc.) went up by 20, 30, and 40 per cent. Tin and rubber went up very rapidly in August, but declined practically just as fast in September. Flour is perhaps the most important food stuff that has shown a tendency to decline. A full analysis of the prices movement by groups of commodities is appearing in the current issue of the Labour Gazette.

Retail prices, of which the Department is receiving quotations for over 30 articles in every town of 10,000 and upwards in Canada, have been on the whole steady in September after the first upward movement following the war. In flour and sugar further advances occurred in most of the cities, but in other commodities prices were quiet. Rents were downward in some fifteen localities throughout the Dominion.

It is interesting to note that in England the Economist's index number went up 6 per cent during August, the rise being greatest in foodstuffs and least in minerals, while the Statist's index number went up from 82 at the end of July to 87 at the end of August. Bradstreet's index number for the United States went up 12 per cent in August, but has eased off slightly since. The crest of the high prices wave seems to have come about two or three weeks after the declaration of war.—Labor Bureau, Ottawa.

REPORT OF THE COMMISSION ON TECHNICAL EDUCATION

II

THE RURAL SCHOOLS OF DENMARK

(A) THE ELEMENTARY SCHOOLS

FROM 1901 to 1911 the urban population of Canada increased 62%, but the rural population increased only 20%. A similar movement from country to town is going on in all the countries visited by the Commission, except Denmark. The portion of the fifty pages of the Report which treats of the rural schools of Denmark is therefore of special interest, as suggesting methods of preserving the equilibrium between country and city. The subject naturally falls under three heads,—the Elementary School, the People's High School, and the Agricultural School.

A. THE ELEMENTARY SCHOOL. COMPULSORY EDUCATION

For over one hundred years Denmark has had compulsory school attendance and a system of fines for neglect and truancy. Speaking generally, the compulsory age limit is from the beginning of the seventh to the fourteenth years, and in rural schools each class must have 41 weeks of 18 hours each, i. e. 758 hours per year, exclusive of physical drill, needlework and manual training.

The rural school attendance is arranged so that each class (grade) receives instruction either for six half days or for three whole days each week. This arrangement is generally combined in such a way that the pupils of the senior grade attend oftenest in winter and those of the junior grade most frequently in summer. Those who permit their children to neglect school without lawful cause are fined three cents the first day and a larger amount for succeeding days until a maximum average of twenty-five cents a day is reached. In default of payment the fine may be enforced by execution or imprisonment.

TEACHERS

For permanent appointment, a teacher in public schools, in addition to graduation, must be 25 years of age and have had two years previous practice work in teaching. Country districts have male head teachers, assistant teachers, female teachers and Primary school teachers. The teachers in rural school districts receive, in addition to salary, the use of a dwelling with garden and fuel. The dwelling for principal must have three rooms with outside conveniences.

SUBJECTS AND EQUIPMENT

The compulsory subjects for rural schools are Danish (an average of at least 287 hours annually), Religion, writing, arithmetic, history, geography, music, physical drill (for boys) and needlework (where a female teacher is engaged). Instruction may also be given in nature study, hygiene, manual training, domestic science, and physical drill for girls. School baths may also be included in the curriculum.

Books used exclusively in the school are provided by the municipality. Those used in school and at home are provided by the parents (when financially able).

WRITER'S COMMENT

In the foregoing the following unusual conditions are worthy of note:—

1st. There is a system of compulsory education which is rigidly enforced in rural districts.

2nd. Rural school teachers are provided with residences.

3rd. More than one third of the rural school time is devoted to study of the Mother tongue.

S. B. S.

COUNCIL OF AGRICULTURE OF THE PROVINCE OF QUEBEC

Meeting of August 26th, 1914

MINUTES of a meeting of the Council of Agriculture of the province of Quebec, held at Three-Rivers, in a hall of the Three-Rivers Exhibition Company, at 2 o'clock P. M., on Wednesday, the twenty-sixth day of August 1914.

The President and the Vice-President being absent, Mr. Robert Ness was chosen to preside at this meeting, on proposition of Mr. Jos. Lafontaine seconded by Mr. L. Lavallée.

Present:—Messrs Robert Ness, A. J. Dawes, Hormisdas Pilon, J. C. Draper, Louis Lavallé, Joseph Lafontaine, J. B. Carbonneau, Robert E. Skillen, Chas. C. Descary, François Manseau, John Hay and Donat Caron, forming a quorum.

The secretary read the minutes of the meeting of March 18th, 1914, and, on proposition of Mr. Carbonneau, seconded by Mr. Lafontaine, these minutes were adopted.

Read letters from Messrs Paul Tourigny and Thomas Hunter, giving the reasons of their non-attendance at this meeting.

Read a letter of thanks for sympathy, from the family of François Manseau.

Read an Order-in-Council, No. 475, approved by the Lieutenant-Governor on August 23rd 1914, appointing Mr. Donat Caron, a member of the Legislature, from St. Octave de Métis, county of Matane, a member of the Council of Agriculture, to replace Mr. O. E. Talbot, retired.

THE GARDEN AND ORCHARD

STORAGE OF VEGETABLES

Valuable Hints on the storage of potatoes, cabbage, celery, carrots, beets, onions, squash, etc

ALMOST any place which is frost proof may be used for storing vegetables, the commonest being specially constructed houses, house and barn basements, and outside pits.

For best results, the storage must be cool and moist, with good air circulation to prevent any moisture collecting on the ceiling to drop on the vegetables. The best temperature with nearly all vegetables is between 32° and 40° F. Pits, where used, should be on well-drained soil and protected if possible from the north and west wind. They should run north and south to give an even distribution of sun's heat on bright winter days.

Potatoes:—Are best kept at 32°—36°F. Air should be sufficiently moist to prevent shrivelling. If the potatoes are placed in bins in cellars, these should have the sides and bottoms boarded to keep them from the walls and floor. The bins should not be more than four feet deep. If the air is dry they should be covered with sand which is kept moist. All the potatoes should be sorted before placing in the bin. If a pit is a thing of necessity, it should be made as follows:—Choose a high, well-drained piece of ground, 4-6 ft. wide and cover with straw 4 inches deep. Then place the potatoes in a conical pile, cover with long straw 4 inches deep, then 6 inches of earth. If they are to remain all winter a second layer of straw and earth should be applied, and in very severe weather it may be well to cover with strawy manure. Every 10 ft. place a tile which comes up through the covering and affords ventilation. These should be filled with straw on cold nights.

Celery:—A cool damp cellar with a temperature of 32°-34° F. gives best results. It is generally planted in sand in beds 6 ft. wide with passages between 12-18 inches wide. The plants are put in rows across the bed, 4 inches between each row and touching one another. It should be well watered at the roots when put in and afterwards when dry. No water should be allowed to get on the leaves. At all times good air circulation is necessary. Small quantities ol celery can be put in a box in a similar manner and will blanch thoroughly in a small cellar.

Cabbage:—Keep as near freezing as possible at 30°-32° F. The root should be cut off leaving only one or two of the outer leaves. They are best stored on slatted shelves 2 feet apart, the cabbages being placed in double rows. They may easily be kept in pits or trenches. The heads are placed in rows of 3 or 5 across the pit, tucking the outer leaves under the head. Then the next layer which would be 2 or 4 cabbages wide, is laid and so on up to an 'A' shape. The outer leaves of each layer are allowed to hang over and form a thatch roof. The pile may be of any length and is covered as for potatoes.

Carrots:— If kept in storage they should be on slatted shelves, never more than 2 feet thick, and lightly covered with sand. They heat easily and must therefore have good ventilation and a temperature of 34° F. If placed in pits, the pile should be small and covered as for potatoes.

Beets, Parsnips, Turnips and Salsify may be handled like potatoes.

Onions: A dark dry cellar with a temperature about 38°-40° F. They may be placed on shelves in layers 8 to 10 inches deep, or in slatted bushel boxes. They should never be frozen, In warm weather give them air at night and close storage in day time. They are sometimes held in a frozen condition by covering with hay. They should never be handled when in this condition, but frozen onions never keep long after thawing out.

Squash:—Should be taken in before frost in the fall. Place in a cellar about 40° F. May be placed on slatted shelves 2 feet apart. Where one is holding over a large quantity they should be in a separate place from the vegetables.

Cauliflower heads may be wrapped in oiled paper and kept at a temperature of 30° F., or the whole plant may be taken up and hung in a cool cellar.

A. H. McLENNAN,

Macdonald College

THE OLD MILL ON THE CHATEAUGUAY RIVER

Read an Order-in-Council No. 499, approved by the Lieutenant-Governor, April 25th 1914, appointing Mr. Michel Archambault, from the parish of St. Dominique, county of Bagot, a member of the Council of Agriculture, to replace Mr. Dr W. Grignon, retired.

ELECTION OF OFFICERS

Mr. Dawes proposed, seconded by Mr. Lafontaine, and resolved:—

FIRST RESOLUTION:—That Mr. H. Pilon be elected president;

Mr. Skillen proposed, seconded by Mr. Descary, and resolved:—

SECOND RESOLUTION:—That Mr. Jos. Lafontaine be elected vice-president;

Mr. Carbonneau proposed, seconded by Mr. Lavallée, and resolved:—

THIRD RESOLUTION:—That the Committee on Agricultural Merit Competition be composed of Messrs Ness, Tourigny, Draper, Hunter, Roberge, Lavallée, Lafontaine, Manseau and Caron;

Mr. Ness proposed, seconded by Mr. Caron, and resolved:—

FOURTH RESOLUTION:—That the Committee on Agricultural and Veterinary Schools be composed of Messrs Dawes, Pilon, Lafontaine, Messier, Skillen, Carbonneau and Descary;

Mr. Lafontaine proposed, seconded by Mr. Lavallée, and resolved:—

FIFTH RESOLUTION:—That the Committee on the Agricultural Journal be composed of Messrs Venne, Descary, Carbonneau and Hay;

Mr. Dawes proposed, seconded by Mr. Skillen, and resolved:—

SIXTH RESOLUTION:—That the Commissions on Herd Books for the various breeds of animals be composed of the Hon. Mr. Dubord and of Messrs Ness and Lavallée.

The secretary read the report of the members of the Committee on the Agricultural and Veterinary Schools, who have visited, in the course of July last, the Ste. Anne-de-la-Pocatière Agricultural School, the Oka Agricultural Institute, the Macdonald College and the Veterinary School of Montreal.

Mr. Ness proposed, seconded by Mr. Lavallée, and resolved:—

SEVENTH RESOLUTION:—That the report of the members of the Committee on Agricultural and Veterinary Schools be adopted.

Mr. Dawes proposed, seconded by Mr. Lafontaine, and resolved:—

EIGHT RESOLUTION:—That thanks be tendered to the directors of the Exhibition Company of Three-Rivers, for their having so kindly put at the disposal of the members of this Council, the room required for their meeting and for their invitation to a lunch, in company with the Hon. the Ministers of Agriculture and Rural Roads, as well as the officers and the directors of the company.

The secretary was charged to transmit a copy of this last resolution to the secretary of the Exhibition Company and to the newspapers.

Mr. Draper proposed, seconded by Mr. Manseau, and resolved:—

NINTH RESOLUTION:—That this Council do now adjourn.

OSCAR LESSARD,

Secretary

SEASONABLE NOTES ON FLORICULTURE

Management of the Hardy Flower Bed

IN order that the plants in the border may make a satisfactory growth from year to year it is necessary that sufficient plant food be given. Toward the latter part of this month is a good time to apply this, in the form of fairly well decomposed farmyard manure. Be liberal with this, as it has to serve the double purpose of plant food and winter protection. The fact that a sertain class of plants are classed as hardy perennials does not render them immune from being winter-killed. Soil and climatic conditions have to be taken into account, for instance a dry fall leaves the soil in such a condition that the extreme cold finds a ready passage through the air channels, with the result that the roots may be entirely killed or seriously injured; or, on the other hand, alternate thawing and freezing may seriously injure the crown of the plant. This being so, it is for us to try in every practical way to prevent such disasters, and no more practical means can be adopted than the one already mentioned. The coating of manure affords protection from severe early frosts before we get the natural covering of snow, and this rough manure holds the snow and causes it to pile up, thereby affording still greater protection, and on account of this there is little or no damage from alternate freezing and thawing. In the spring this manure is dug into the border to complete its dual purpose.

Winter Protection of Roses

While roses are more or less hardy, it is not safe to risk them without some protection. The hybrid perpetual class is the hardiest, and in some parts of the province may winter well without protection other than that nature affords, but hybrid Teas and Ramblers are more tender, and must be protected. About the end of this month is early enough to do this, as the wood by that time will have got thoroughly ripened and somewhat used to low temperatures, and will be in good condition to stand the extreme cold with protection later on. There are many ways of giving this protection, depending on where and how they are planted. For single plants in the open, tie the growth together loosely, then bank soil high up around the plant and place an old barrel without ends over, and fill in with old hay, straw or leaves. For larger plantations the simplest way after first tying the growths together is to bend them over as far as possible to reduce the height, then smother them with leaves raked from near by, or with strawy manure, place a few pieces of old board on top for a time to prevent wind blowing the covering away until the snow comes, when they should be removed.

With rambler roses such as the Crimson Rambler, Dorothy Perkins and others which are specially adapted for covering walls, fences and such like, the growths must be taken down, tied together and laid on the ground, when they can be covered with a little soil, finishing the covering with leaves or strawy manure. It is of the utmost importance that this be done, as if the growths are left exposed on the wall or fence they are almost certain to be killed all the way down to the snow like, with the result that there are no flowers the following summer.

Bulbs

It is not too late yet to plant bulbs. Single, doule and polyanthus narcissus, and tulips in types are excellent for this purpose. Tulips are better adapted for planting in a formal bed than narcissus. Use narcissus in little irregular clumps here and there in the hardy flower borders, or they may be used to advantage planted in little nooks in the lawn. In planting a flower bed or border dig in a liberal quantity of well rotted manure, form soil well by walking over it, and rake level. Set bulbs at least six inches deep and from six to eight inches apart, according to means and type of bulb. Cover the bed with strawy manure. This protects from severe freezing in the early part of the winter and tends to gather a greater depth of snow for further protection. To plant bulbs in grass without defacing the lawn in any way, take a sharp spade and drive it into the sod at right angles from you, then drive the spade in across the cut already made, and while the spade is in bear down on the handle; the turf then opens up, and while held in that position place the bulb in, take out the spade, and place the foot over the bulb to press sod into position.

Digging

All ground intended for the sowing and planting of flowers should be dug without further delay while the soil is still in good working condition. By doing this work in the fall the soil is put in better shape for working early in spring, not only this, but the manure dug into the soil becomes thoroughly broken down and incorporated with the soil, and is in better condition to be used by the plants; moreover, the soil settles down as the snow leaves, bringing it into direct contact with the underlying soil, thereby offsetting any danger from lack of moisture, which is the trouble with spring dug soil, which often dries out to the bottom of the digging.

A few words on digging might be helpful to many. The average amateur in digging a piece of ground usually spreads on whatever manure he intends using and starts in to dig at some point, and he is in a mess from start to finish. A ploughman has to take out openings, or make breaks as he terms it, in order to have a place to turn his next furrow, so the gardener has to take out an opening to have a place to put his next spading. Therefore in digging, take out the first spading across the entire piece to be dug, remove it in a wheelbarrow to the other end, and dump it down there to be used for filling in when the last spading is taken out. In this way you save a place for each spading turned over, your piece of ground is thoroughly dug, and the work has been a pleasure.

Notes

To keep Dahlia tubers, Canna roots and tuberous Begonias dormant and fresh till spring, pack in dry sand in a cool cellar. Gladioli bulbs after being thoroughly dried off may be stored away in bulk in any cool room. Fuschias and Hydrangeas, which should be resting during the winter months, should be kept in a cool damp cellar, water being given only to prevent shrivelling of the wood.

A. H. WALKER,
Florist, Macdonald College

WAX RENDERING

THE most valuable by-product of the apiary is beeswax. In the natural process of production the comb honey producer does not get a large quantity of this, but to the extracted honey man it represents a nice sum of money. Beeswax, after it has been refined, is readily salseable at a good price, and all scraps of comb and cappings that collect during a season's work in the apiary should be carefully saved to be rendered.

There are various methods employed to convert comb and cappings into cakes of beeswax suitable for commerce. All methods call for the application of heat in various forms. One very handy form of wax extractor is known as the solar type. This is simply a tight box with a glass cover, containing a three-sided metal pan and screen, and a receptacle for receiving the melted wax. This is placed in a slanting position in the sun, and combs or other particles of wax to be rendered, are laid on the pan. The heat of the sun melts the wax, which runs down through the screen into the receiver. This is a good way for new comb or cappings, as practically all the wax will be obtained. For brood combs it is not a good method, as the degree of heat in the solar wax extractor does not rise high enough to thoroughly melt all the wax in them. The best class of wax extractor is that run by steam or hot water, and pressure. It does very efficient work and will extract all but 2 or 3 per cent of the wax in combs rendered. When a beekeeper has much wax rendering to do it is strongly advisable to employ one or the other of the above mentioned types of wax extractor, as by so doing the percentage of wax lost is greatly reduced. The German wax press heated by steam consists of a metal can with a sloping, perforated false bottom; over this is an iron spider on which sits a basket of wire screening. The metal cover of the can is made to accommodate a strong screw with a plate on the end of it fitting loosely into the perforated metal basket. In use the can is set on the stove and the bottom filled with water. Combs or cappings are wrapped in cheese cloth and placed in the metal basket. The water boils and heats the combs and melts the wax, pressure meanwhile being applied by the screw through the cover. The wax drips down on the false bottom and runs out through a tube into a can outside. This style of press is quite handy to use, but the quality of wax is not quite so high as that obtained from the hot water press owing to the high temperature employed to melt the wax. The hot water press is a metal can containing two or three slatted wooden dividers which are placed in a horizontal position. This can sits on a wooden platform, and has a frame built over it in order to make use of a screw for pressure in a similar manner to that of the German wax press. In using this machine another vessel is necessary which contains water and combs to be rendered. This vessel sits on a stove, or else is heated by a steam jet, and combs are thoroughly melted and broken up in it. The mixture of combs and hot water is ladeled from this heated vessel into the can with the slatted dividers, and pressure is at once applied with the screw. These slatted dividers separate packages of comb wrapped in cheese cloth in a similar manner to that of the German wax press. This is a very good method, and extracts very nearly the total percentage of wax.

For the bee-keeper who has only a few pounds of comb to render, a home-made appliance may be got together. A large sized vessel of water (copper is the best) is placed over a fire and heated until it boils; combs to be rendered are enclosed in a sack and placed in the water. After a sufficent interval has elapsed to allow the contents to melt, the sack is vigorously pressed and squeezed to separate the wax from slumgum, i. e., residue of pollen, cocoons, etc. The wax rises to the surface of the water and is skimmed off. This process is repeated several times in order to obtain all the wax as far as possible. Wax obtained from the solar wax extractor is of nice color as a rule and does not contain very many impurities. Wax from other processes has not such a nice color or aroma and it quite often has a larger quantity of impurities. The quality of wax is judged by the color largely and by the impurities it contains. To further refine wax from steam or hot water presses, proceed as follows,—Partly fill a copper vessel with water and heat it until the temperature of the water exceeds 143° Farh. (melting point of wax) by several degrees. Then throw in the cakes of wax and let them melt. As soon as they have thoroughly melted, remove the copper from the fire and set aside to cool. Remove the cake of wax from the vessel and scrape off the bottom, and the result should be a clean, yellow, sweet-smelling cake of wax,—the finished article.

HARRY W. JONES,
Bedford, Que

SUPPLIES OF FARM AND GARDEN SEEDS

CANADA is in the unfortunate position of depending largely on Europe for her field root and garden seeds. France and Germany are sometimes called the seed gardens of the world. Last year we imported 1,285,198 lb. of beet and mangel seed, more than 900,000 lb. of which came from those two countries. Half of our carrot seed (33,000 lb.) came from France and 22,000 lb. from the United Kingdom. Apart from sweet corn, beans and peas, most of our vegetables seeds are not grown in Canada. Tomato, onion, cucumber and melon seeds are produced to a limited extent, but come mostly from the United States. Cabbage, cauliflower, celery, parsnip, garden beets, radish, and like crops are mainly from European seed. Florists' stocks have been obtained principally from Germany, and these offer the most serious difficulties at present.

It is estimated that the reserve supply, together with the 1914 crop in Europe that will be available, will enable Canadian seedsmen to meet the 1915 demand for all principal kinds, except perhaps some florists' stock. Mother plants of such biennials as mangels, beets, cabbage, celery and the like should be selected and stored this autumn, before they are injured by frost, for the production of seed next year for 1916. It is important that Canadian farmers and gardeners make provision

THE FARM AND FARM CROPS

ANNUAL REPORT OF THE MINISTER OF AGRICULTURE, OTTAWA

THE Report of the Minister of Agriculture for the Dominion of Canada for the year ending March 31st, 1914, has been issued.

In the opening section, of which there are five in addition to nineteen appendices, references are made to the legislation affecting the Department passed during the year, The Agricultural Gazette, the general assembly of the International Agricultural Institute, the International Meteorological Commission and other matters of general interest. This is followed with brief reviews of the many services carried on in the separate Branches, including the Dairy and Cold Storage, Seed, Live Stock, Experimental Farms, Health of Animals, Patents of Invention, Copyrights, and Public Health.

This report, which is issued as Sessional Paper No. 15, is a volume of 119 pages. Copies are available at the Publications Branch, Department of Agriculture, Ottawa.

ANCIENT ADVICE FOR FARMERS

HESIOD, one of the earliest Greek poets, said by Herodotus to have been a contemporary of Homer, in his poem the title of which is usually translated as "Works and Days", but which might appropriately be rendered "The Husbandman's Calendar", has this to say about the importance of keeping up with one's work:

"The work-deferrer never
Sees full his barn, nor he that leaves work ever,
And still is gadding out. Care-flying ease
Gives labour ever competent increase:
He that with doubts his needful business crosses
Is always wrestling with uncertain losses."

---

for their requirements now. The soil and climate of Canada provide superb conditions for the production of field root and garden seeds. That they have not been grown here in quantity for commerce is due to the fact that European women labour at 50 cents per day can accomplish more than unskilled men on Canadian farms who receive $1.50 per day. The subventions now offered to Canadian growers, however, are sufficient to offset European cheap labour.

Subventions for Canadian Seed. The following is a schedule of the kinds and varieties of seeds, the amount of subvention that may be paid per lb. of recleaned seeds to bonâ fide growers of them, and the minimum and maximum number of lbs. of selected seeds of each kind for which any person or company of persons may receive a subvention:

Kind of seed	Subvention per lb.	Number of lbs for which subvention may be paid.	
	cents	minimum	maximum
Mangel or sugar beet	.03	100	10,000
Turnips or swedes	.04	50	5,000
Carrots, field or garden	.07	30	3,000
Beets, garden varieties	.10	20	2,000
Parsnip	.07	10	500
Radish	.09	10	1,000
Cabbage	.25	10	400
Tomato	.50	10	100
Onions	.25	10	2,000
Celery	.40	10	100
Lettuce	.20	10	500
Cucumber	.20	10	100
Water-melon	.20	10	100
Muskmelon	.30	10	100

From the present outlook it seems desirable that at least half of the field root and garden seeds required in Canada be grown here. Growers should place themselves under the consulting direction of experts employed by Federal or Provincial experiment stations who are working with the kinds of crops to be grown.

GEO. H. CLARK,

Seed Commissioner, Department of Agriculture

CONDITION OF THE CROPS

OTTAWA, October 16. A bulletin issued today by the Census and Statistics Office gives provisional estimates of the yield and quality of the principal Canadian grain crops, and also the condition of root and fodder crops, as compiled from reports of correspondents made on September 20. In general the reports confirm the statement issued last month, the average yields per acre being about the same as then estimated for wheat, but being somewhat less for oats, barley and flax.

The total yields for Canada of the principal grain crops in bushels are as follows: Wheat 158,223,000 oats 311,426,000, barley 34,491,000, rye 2,258,000, peas 3,537,100, beans 823,400, buckwheat 9,159,000, flaxseed 7,533,000, mixed 16,458,000 and corn for husking 14,732,000.

The average quality of the grain crops at harvest time, measured upon a percentage basis, —100 representing grain well headed, well filled, well saved and unaffected to any appreciable extent by frost, rust, smut, etc.,—is for the whole of Canada as follows: Wheat 78. oats 79, barley 76, rye 82, peas 75, beans 82, buckwheat 81, mixed grains 90, flax 64 and corn for husking 80. For wheat, barley and oats the figures are considerably below the excellent record of last year, the averages this year being reduced by the prolonged drought in the Northwest provinces. In these provinces the points for the quality of wheat, oats and barley range from 48 for barley in Saskatchewan to 78 for spring wheat in Alberta. In the Maritime provinces both the yield and quality of the grain crops are excellent.

The condition of root crops at September 30 is for all Canada about equal to last year, being 75 p. c. of a standard or full crop for potatoes, 78 p. c. for turnips, 80 p. c. for mangolds, carrots, etc., 89 p. c. for sugar beets, 90 p. c. for fodder corn and 76 p. c. for alfalfa. In Manitoba and Saskatchewan the condition of the root crops is low owing to the drought. In Northern Alberta, where the season was of more normal character, these crops make a fair showing.

During September conditions have been generally favourable for harvesting and threshing, and in the Northwest provinces a great deal of threshing was completed by October 1. There are indications that the amount of fall ploughing this year will be greater than usual.

VISIT TO MACDONALD COLLEGE

Committee of Agricultural Council of Quebec make a careful inspection of the College

ON the 17th July the Committee of the Agricultural Council of Quebec, consisting of the President, A. J. Dawes, Hormisdas Pilon, R. E. Skillen and J. S. Messier, visited Macdonald College and made a thorough inspection of the work carried on both in the College and the farm.

The Agricultural School of Macdonald College ranks among the first in the country. All the various branches of agriculture are taught, including the use of agricultural implements, cereal, clover and alfalfa growing and cultivation, judging of live-stock, butchering, etc. The buildings are of the most modern construction, and are equipped with all the latest appliances. Farmers of the future are trained with the greatest care, and as their number reaches nearly 600, including the girls taking the Teacher's and Household Science courses, it is to be anticipated that agricultural training will be spread throughout the districts where they propose to locate themselves.

The horses are of a very high grade, and the live-stock of the finest quality; none but registered animals are kept, the breeding types being Ayrshires, Short-Horns, Holsteins and Canadians, all of first-class individual value: Professor Barton kindly gave us full details as to the mode of stock raising.

So far as the fields are concerned, the cultivation is of the highest description; no bad weeds are to be seen. The oat fields are in excellent condition. Indian corn covers an area of nearly 55 acres in three different sections, and has a splendid appearance, with promise of abundant harvest. The demonstration fields are admirable, cereals of all kinds being grown, including clover and alfalfa. Professor Klinck, who is an expert in cereals, gave us some interesting information as to alfalfa. "For several years", he informed us, "we have cultivated alfalfa. Each year three good harvests of hay have been obtained, and a fourth one has been left on the land to protect the roots during winter time. The best varieties for cultivation in the province of Quebec are the variegated. Alfalfas such as the Grimm and its sub-varieties. Bad weeds are the most injurious enemies to alfalfa. Failure in its culture is frequently due to the fact that in the second year it is choked with bad weeds". The foregoing remarks of Professor Klinck show that he is convinced that alfalfa can be grown to great advantage in the province of Quebec. The amount of hay produced is much greater than from clover, and is equal or perhaps superior to that of clover. We would certainly recommend farmers to try the culture of alfalfa.

The irrigation system in the gardens and demonstration fields is the same as that described in our report of 1913. It is an economical and very practical system.

The orchards cover a space of 30 acres. There are large quantities of fruits of all kinds, including apples of a large number of varieties. The pruning of the trees has been well done, and a good crop is anticipated. A considerable part of the orchard is under clean cultivation and seeded down to cover crop of crimson and red clover. We strongly recommend this system in orchards.

Poultry raising also receives special care, and is carried on on a large scale.

Dr Harrison, the Principal of the College, accompanied us on our inspection, and through his kindness the Committee were enabled to confer with the Heads of the various Departments who gave us much information on the work and experiments etc. carried on.

The college authorities entertained us at midday lunch, which concluded a very pleasant visit to Macdonald College.

ANDREW J. DAWES,

President

RED-CLOVER SEED PRODUCTION

Factors that make for Success: Practical Advice for Clover Growers

DURING the past few years a marked stimulus has been given to the work of clover seed production in the Province of Quebec. A number of factors enter into the situation. Clover seed has been advancing in price year by year until it is now so high that many farmers are making lighter seedings, while others have stopped seeding almost altogether. Not only is the price high, but we frequently have difficulty in getting good strong seed of high germination and true to variety. Clover seeds so closely resemble each other that it is impossible to distinguish them until we see the plants which they produce.

Harvesting alfalfa seed with a clover seed harvesting attachment on an ordinary mower

Noxious weeds in no inconsiderable quantity find their way over the country by way of mixtures in clover seed. These are very difficult, and some are impossible, to clean out of a sample.

Thanks to the work of the Dominion Seed Branch and other organizations, the clover seed trade is constantly being put on a better basis. We are able to-day better than ever before to secure good seed, even though the price is higher. Material aid could be extended to the Seed Branch by an increase in local production of clover seeds. By obtaining seed of proven hardiness from a neighbor, and the exercise of greater care in keeping our fields clean, much of the inferior grade of clover might be eliminated from the trade.

Sufficient experiments have gone to show that with due care and proper handling, clover seed growing in Quebec is a good commercial proposition. With a good supply of seed at one's hand the tendency will be to increase both the rate and the acreage of clover sown, while the growing of seed may well become a source of further revenue on the farm.

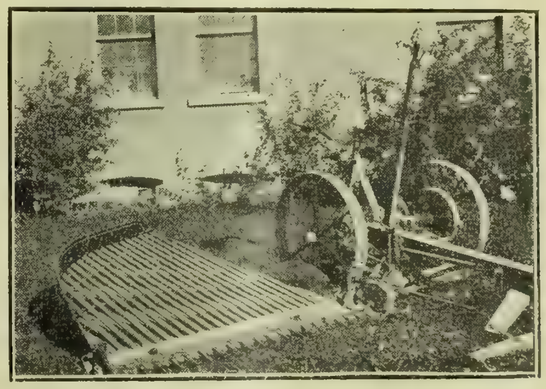
Obtaining a Stand

Among the first things that we must determine in an attempt to secure a stand is the condition of the soil. Red Clover like most legumes requires a soil that is free from acid if it is to give us the best results. It is undoubtedly true that throughout Quebec in general, and particularly in the Eastern Townships, a great deal of the soil is acid. This must be corrected before maximum crops of clover can be obtained. An acid soil is corrected through the use of lime in one form or another. Quick-lime, at the present time, is about the most economical kind of lime. This is very strong and for a given weight contains more Calcium (the corrective agent) than all the other kinds. Air slaked lime is an almost equally good variety, but, it must be remembered, is only one-half as strong. Ground limestone is rapidly becoming a commercial product. Where one is in a position to obtain this it is to be recommended. The Calcium in this product is only available in smaller quantities, but its effect will be felt for a correspondingly longer time. Wood ash and Basic Slag are also sources of lime. Both are good, but the former is difficult to obtain in quantity, the latter too expensive for the amount of lime and fertilizer contained.

Thorough underdrainage or good natural drainage will in most cases be essential to the production of a stand of clover. It has been quite truthfully said that drainage makes the soil "warmer in cold weather, cooler in warm weather; drier in wet weather and wetter in dry weather". In other words, drainage acts as a stabilizer. The most critical time with the young clover plants is in the spring when the land is so full of moisture. Drainage at this time does a great deal in carrying away rapidly the surplus water. Roots of all plants strike much deeper in a drained than in an undrained soil, due to the fact that the water table has been lowered. This gives a decided advantage to the plants in a dry time.

After attention has been given to drainage and soil reaction, we have yet to prepare the soil in the best way. The treatment applied will very largely depend on the previous crop, and also the type of soil in question. The soil should have been plowed deeply—as deep as possible without turning up too much subsoil—at least within a year of planting, preferably the fall before. If the land has been in hoed crop previously and has been plowed deeply in preparation for that crop, it may not be necessary to plow deeply again for clover. Never under any conditions plow just before planting in spring. There is no surer way of getting a poor stand. Given a firm seed-bed, especially if the soil is a light one in which a considerable amount of humus has been incorporated, together with good surface cultivation, and it will be a bad season indeed that does not give a stand.

In securing a stand, the next thing to the soil in importance is the seed itself, and the manner of seeding. Clover seed is graded into four distinct grades, Extra No. 1; No. 1; No. 11 and No. 111. The law requires that all seed offered for sale must be plainly labeled with these official grades. This leaves no excuse for a man to buy and sow seed of low quality. Here it may be well to mention the confusion that exists between Common and Mammoth Red Clovers. So far as our experience in the Cereal Department goes, we find it practically impossible to get Mammoth Red Clover. The seedsman is probably not to blame any more than is the farmer who grew the seed. We have found it quite possible to buy so-called Mammoth Clover, and pay a bigger price for it, only to find that we had nothing but the Common Red.



Clover seed harvesting attachment fitted to a Massey-Harris mower

Under our conditions the best time to seed clover is in the spring, just as early as the land can be got into shape. It is customary to seed with a nurse crop of some kind. Barley is the best nurse crop, wheat next, and oats least desirable. Too often the clover is not given a chance through seeding the grain too heavily. A light seeding permits the air and sunlight to reach the young clover. If seeding with the clover-seed attachment on an ordinary grain drill, turn the spouts so as to seed ahead of the drill. Immediately after seeding, pass the roller over and follow at once with a light scratch from the smoothing harrows.

A practice sometimes advocated in clover-growing is that of seed inoculation. While this is undoubtedly a good practice with alfalfa, which as yet has not been grown over a very large acreage, the wisdom of employing it with clover is rather doubtful. If no clover has ever been grown on that land for some time it might be well to inoculate.

Some soils, particularly in older countries, are what are called 'clover-sick'. This is probably due to a fungus growth which attacks the clover. Very often the term "clover-sick" is used to describe land which has failed to catch with clover for other reasons entirely than the one assigned.

Spring Management

Many people make their greatest mistake in the management of their clover seed field in the spring. Too often an attempt is made to get both a large crop of hay and a large crop of seed. This cannot be done. If the maximum seed is desired, the hay crop must be sacrificed to some extent at least. Clover intended for seed should be cut or clipped by the 20th-25th of June. A practice often followed with such fields is to pasture them lightly up till the middle of June, when a mower is run over set fairly high; this gives all the blooms an even start. If the first growth is allowed to bloom without any clipping back, the set of seed will be very light. This is due to the relatively few insects that are prevalent at that time of the year to carry on the work of fertilization. The clover-seed midge also is much less troublesome in the second growth. Moreover, the first growth is likely to be much more rank than the second. A heavy growth will never bear as much seed as will one that is comparatively light and thin. Both clovers and alfalfas require considerable space in order to get the biggest development of seed.

Frequently we have a year in which the weather will not permit of profitable seed production. If, when the second growth is well in bloom, it should happen that the weather continues wet at frequent intervals, it would be wise to harvest the crop for hay, and not attempt to produce seed. A fair quantity of moisture is required to produce good plump seed. An excess, however, will seriously retard ripening, and will produce a growth of new shoots, along with which it is impossible to produce good seed.

Harvesting

The proper time to cut clover is when the heads have reached a dead brown color. Particular pains should be taken to see that all the seed is ripe, otherwise we are sure to get a large quantity of shrunken and poorly developed material. Seed that is properly ripened before harvesting will be very much more readily threshed than that which contains numerous green heads. Clover that has reached this stage will shell quite readily. This fact makes it a good practice to cut only when the crop is wet with dew—either early in the morning or late in the evening.

Several methods are commonly used in harvesting. An ordinary binder will do the work very satisfactorily if the crop has reached a fair height. It will hardly be advisable to bind the sheaves, as it will dry out much better if left loose. The string attachment can easily be removed, allowing the crop to fall in a continuous row.

The mowing machine is used to quite a large extent. Some growers cut with the mower and follow this immediately with the rake, so as to prevent the horses treading on the last swath when cutting the next. This is a rather slow method. If a mower is to be used, a far better method is the addition of a table to the cutting bar. This is manufactured by all the large firms to fit their machines. It consists merely in a table with a solid floor beneath, and a raised slatted one to receive the clover. A man follows immediately behind with a rake and when the bunches are of sufficient size, rakes them off and throws them to one side. Any threshed seed or broken heads fall between the slats and are held on the table.

Probably the best machine for harvesting is the old type of reaper. Very few of these machines are now available, and it is doubtful if buying one for this purpose alone would be warranted. This machine can be adjusted to pick up a very short crop, and will handle a long one equally well. The rakes place the clover out of the way of the team in the best form for drying. One man with this machine can cut the crop unassisted. In a centre where much seed is being grown, such a machine would make a good investment if bought co-operatively.

Threshing and Cleaning

As with the harvesting, so in the threshing different machines are used to do the work. The ordinary thresher can be made to do the work if no other is available, but it can hardly be considered entirely satisfactory. To operate it, both the inlet and outlet to the cylinder must be stopped up considerably, so as to prevent the straw from passing through too quickly. It should be carried round the cylinder two or three times before being passed out. If the concave is lowered as close to the cylinder as possible, fairly clean work should be done on well matured material. The clover will have to be put through more than once in most cases. Alfalfa and timothy can readily be threshed by this method.

Small huller attachments are now on the market. After the straw has been separated from the heads and chaff, they are passed through this machine and the operation of hulling and cleaning completed. This machine costs in the vicinity of $150. Where the quantity is not too great it is very useful, but the process is somewhat tedious compared with the large hullers.

The Clover Huller is unquestionably the machine for the work if one is available. With this machine the threshing, hulling-cleaning and recleaning are all done in the one operation. The cost, coupled with the amount of horse power required to run it, are the two factors which make it prohibitive for an individual to own one, and even a Club will have difficulty to finance one without Government aid. The Quebec Government owns two of these machines, which are doing good work in a limited way. They are, however, only designed to start the good work of seed production in the Province. Two makes of hullers are prominent—The Sawyer-Massey of Hamilton, Ont., and the Birdsell, of South Bend, Ill. Both are good machines.

Of all the recleaning fanners that are available, the Clipper Cleaner, manufactured by A. T. Ferrell of Saginaw, Mich., does as good, if not better, work than any. This Company puts up machines specially adapted for this work, with a good sieve assortment and an excellent system of wind cleaning. All things considered, we should have a bright future for clover seed production in the Province of Quebec. This work is not for the shiftless farmer, for it demands men of initiative and perseverance, who will spare no pains to make their fields clean, their soil right, and their seed the best that fanning and grading can make it.

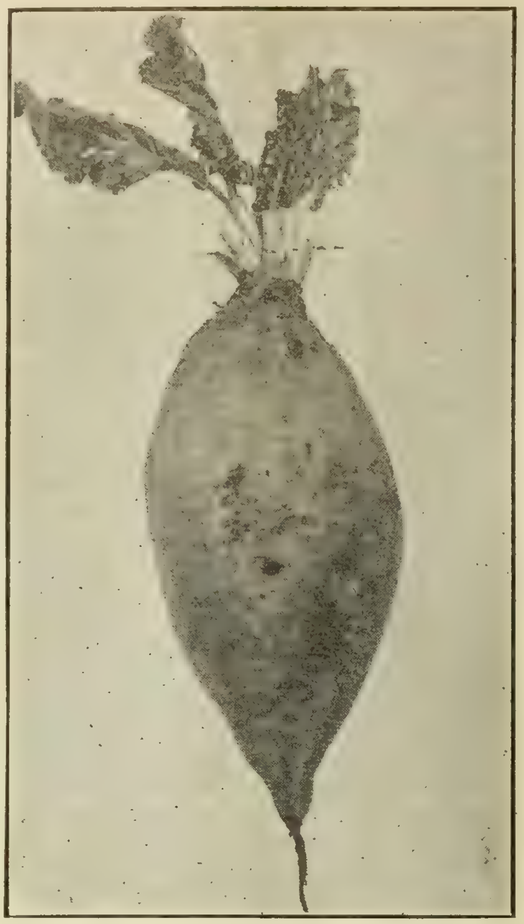
L. C. RAYMOND,

Macdonald College

ROOT - SEED PRODUCTION

Practical Suggestions for the Beginner in Selecting, Storing And Planting Seed Roots

IS it advisable that Canadian farmers should grow their own root seed? From a general point of view there are several reasons why a man would be justified in answering this question in the affirmative. As a matter of fact, under the present terrible conditions in Europe whence we obtain the greater part of our imported root seed, it may even become a necessity. The quality of the root-seed offered on the Canadian market is not always the very best either in regard to trueness of type or to percentage and vitality of germination. It is further false economy to import practically all the seed needed for a twenty million dollars crop, if this seed can be raised within the country. And we will finally in all likelihood, as hinted above have to face a scarcity in the root-seed supply which simply must be covered through home production.



Good Seed Root of Intermediate Type.

We have not yet had a very wide experience in root-seed growing here in Canada, but judging from obtainable records and reports, it is both possible and profitable to produce seed in different parts of the Dominion, at least for home consumption. Of those who have tried it, all agree that they obtained seed of higher germination which produced more roots of better quality than the average market seed.

Choice of Kind

The first problem for the future seed grower is choice of kind: Shall he grow mangel seed, swede, or carrot seed? The answer depends largely on locality and personal inclination. The grower who prefers mangels will very likely get better results with seed production from this kind, provided his farm is so situated as not to suffer from early spring or fall frosts. Young mangel shoots are more susceptible to frost injury in the spring than swedes, and as the mangel seed ripens comparatively late it is also more liable to become "frost bitten" in the fall than swede seed which reaches maturity before any frost danger occurs. Generally speaking, the further east we go the better are the possibilities for swede seed production. Carrot seed ripens very unevenly and has to be picked by hand during a period of several weeks, which makes the culture rather expensive under our conditions, except for home use.

All our cultivated roots are biennial, which means that the root itself is grown one season, is stored over winter, and is made to produce seed when planted out the next spring. Root seed is grown from either large, fully matured roots, or from smaller, not quite developed roots, also called "stecklings". The man who starts in right now will necessarily have to select large roots for mother plants. And this is perhaps just as well, because large roots are more easily judged for type, uniformity and other general characters than stecklings which do not show their good or poor characters nearly as distinctly. The production of seed from stecklings necessitates "stock seed" from choice mother roots, belonging to a pure strain. So far, Canadian grown stock seed has not been available, but at Macdonald College there are now several promising strains of mangels and swedes which may be propagated next year for distribution in 1916.

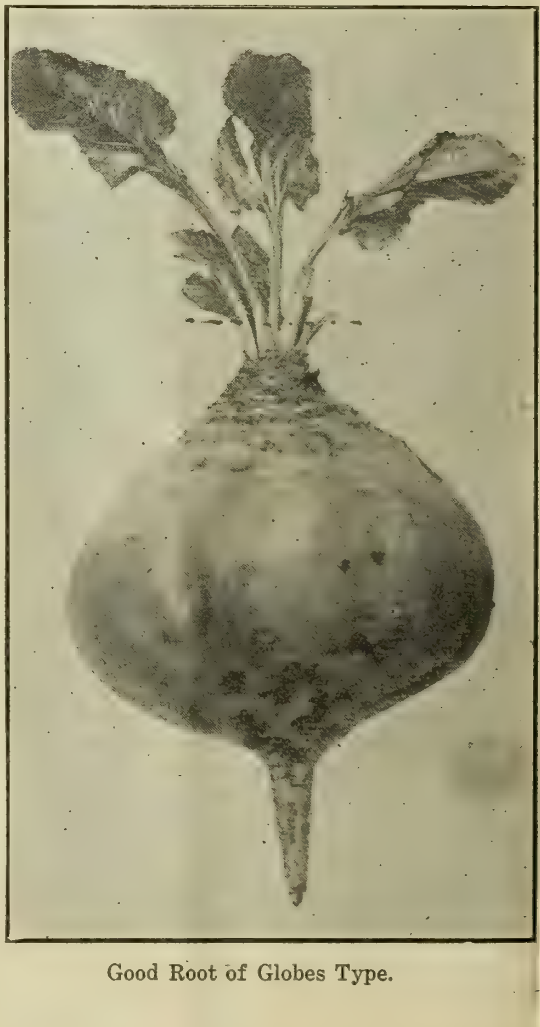
Selecting

Before selecting the seed roots the grower must have a clear conception of the type he intends to breed. For convenient inspection the roots may be lined up with the tops laid together for two and two rows, as can be seen in the picture on the front page of the present number of the Journal. The selected roots are turned about, with tops out, and are later collected for a second survey, when all out of type specimens may be discarded. What should be looked for is a sound, large, well developed, though by no means overgrown root, true to type and possessing a neat crown, smooth surface, full rounded tip and freedom from prongs. Certain varieties, especially among the swedes, are naturally somewhat prongy. In that case the breeder must aim to select specimens which have the prongs confined as much as possible to the bottom of the root.

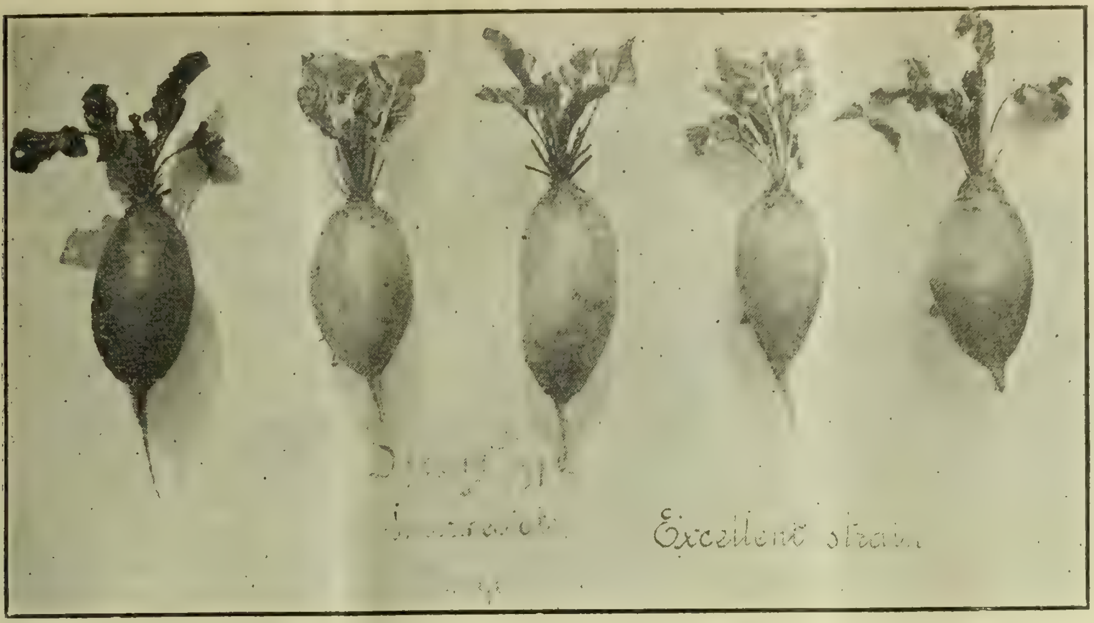
It should be remembered that the main seed stalk grows out the following year from the heart, as it is called. On this account one must be sure not to injure this point when topping the seed roots. The top may either be carefully twisted off, or, still better, it can be cut off one to two inches above the heart. The accompanying photograph illustrates this point quite clearly.

Storing

Seed roots spoil very easily, like most other good things, and should therefore be handled care-



Good Root of Globes Type.



Five Mangels of an exceptionnally well-bred strain of "Yellow Intermediate".

fully. The sooner they can be stored, after pulling, in a cool, not too dry place the better. Where a good root cellar is at hand it is advisable to store them there, if possible in standing position and surrounded with peat soil or moist sand. Otherwise it is better to store them in an outside pit on well-drained ground. The pit is made about 6 feet wide, and the roots are piled up 3 feet high, with slanting sides so that the covering material will not slide down. After piling, the pit is immediately covered with a thin layer of straw, just enough to keep a 4 inch layer of soil from falling in among the roots. The top of the pit is left without any soil so that the heat may escape more readily until the weather gets colder. When it commences to freeze the pit is further covered with 6 inches of straw, followed by 6 to 8 indches of soil, and when zero weather sets in it must finally be protected with a layer of strawy manure. To ensure quick cooling of the roots it may be advisable to run a 4 inch ventilating shaft at the bottom of the pit and to draw exhaust pipes from this shaft to the top, but the openings should be closed on warm days and must, of course, be stuffed with straw, or with some other insulating material, when the temperature goes down below 28 degrees. Seed roots do not stand drought very well, and many growers, therefore, prefer to place the pit on, or at least in the vicinity of, next year's seed field in order to shorten the haul from pit to planting place. In this connection it might be well to remember that the planting of the seed-roots in spring time should be done on a cloudy and calm day in preference to a day with bright sun and heavy wind, which tend to dry out the exposed roots and consequently to lower the yield of seed.

Planting

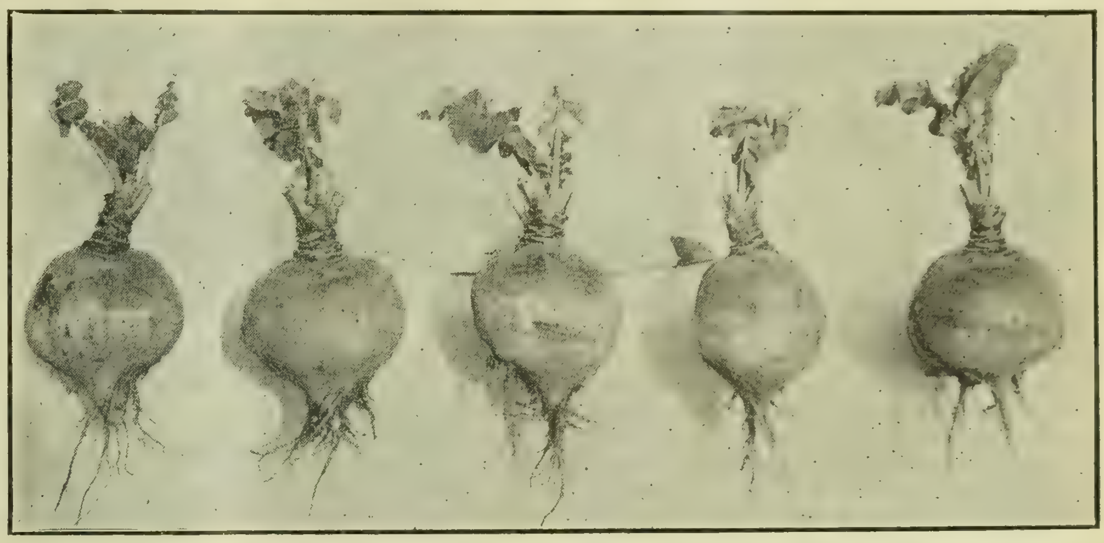
Being naturally cross-fertilized, roots of different varieties, belonging to the same kind, should not be planted close to one another. Two mangel varieties may be safe if they are separated 100 to 250 yards, especially if the fields are divided by a wood lot, or by a field of tall growing corn. Swedes and turnips, again, require even wider distances. They not only cross with varieties of their own kind, but also intercross, i. e. a swede may cross with a turnip and vice versa. In districts where the Bird Rape (Brassica campestris) is prevalent pains should be taken to exterminate this weed, as it is a danger in this respect for both swede and turnip seed production. Carrot varieties cross with each other and with the wild carrot. Where this weed is common it is simply impossible to grow first class carrot seed.

Land intended for seed growing should above all be rich, well drained and, if possible, sheltered from heavy winds. Liquid manure is a splendid fertilizer for seed roots. On most soils it is advisable to supplement the liquid manure with 300 to 400 lbs of Acid Phosphate per acre. Where a general mixture of commercial fertilizers is used it is better to supply the nitrogen with Sulphate of Ammonia than with Nitrate of Soda, as the latter tends to rush the growth of the young seed stalks too much, making them weak and less resistant to wind pressure.

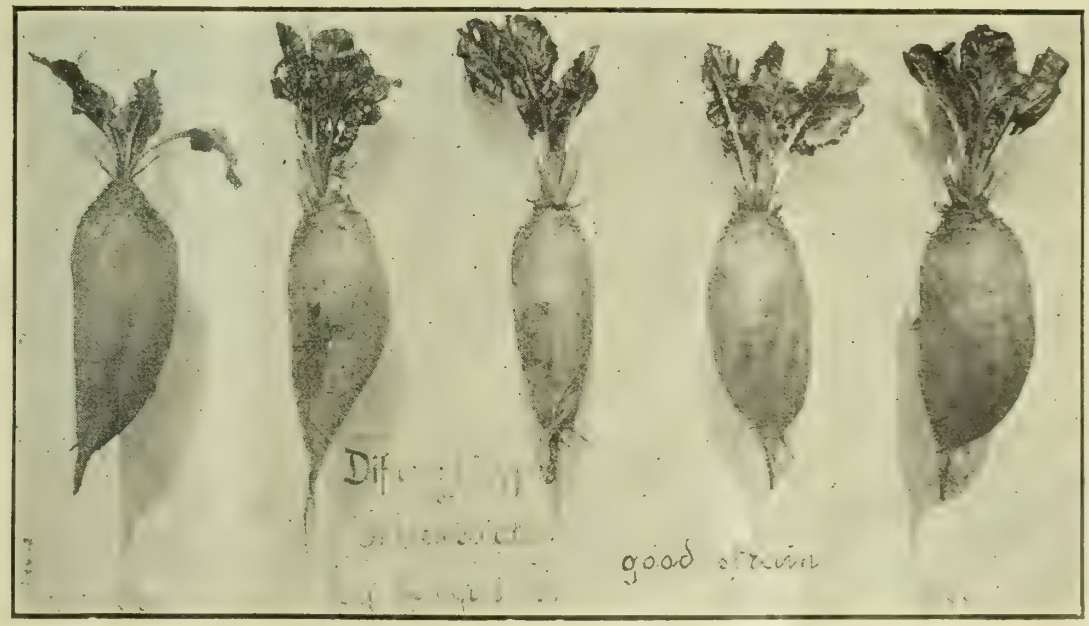
After the land has been properly worked it should be well packed with a roller and marked before planting. Common distances are 24 inches by 24 inches for small roots and 30 inches by 30 inches for large roots. Three men, when used to the work, can plant about 3000 roots in a day. One men lays out the roots in their places, another digs the holes and the third man puts in the roots. The root in the first hole is covered with the soil from the second and so on. Where the soil is deep enough the roots should be planted firmly straight up and down, and should be set so deep that the crown barely reaches the surface. With long shaped varieties and on shallow soils it may be advisable to tilt the root, always remembering to plant them as deep as the soil will permit with the crown reaching the surface. If the plow is used the roots are placed against the land side in the opened furrow. It is a good plan to cover them partly by drawing loose earth with one stroke of the foot to the bottom of each root so that they may keep in position when the furrow is thrown back. Unless, however, the workers are familiar with this method, it gives scarcely as satisfactory results as the spade planting method which causes a firmer and more regular stand. The root-seed land should be kept cultivated as long as possible in order to preserve the moisture. On smaller areas it pays well to use the hand cultivator between the rows, when the length of the seed-stalks prevents the use of the horse cultivator.

Harvesting and Threshing

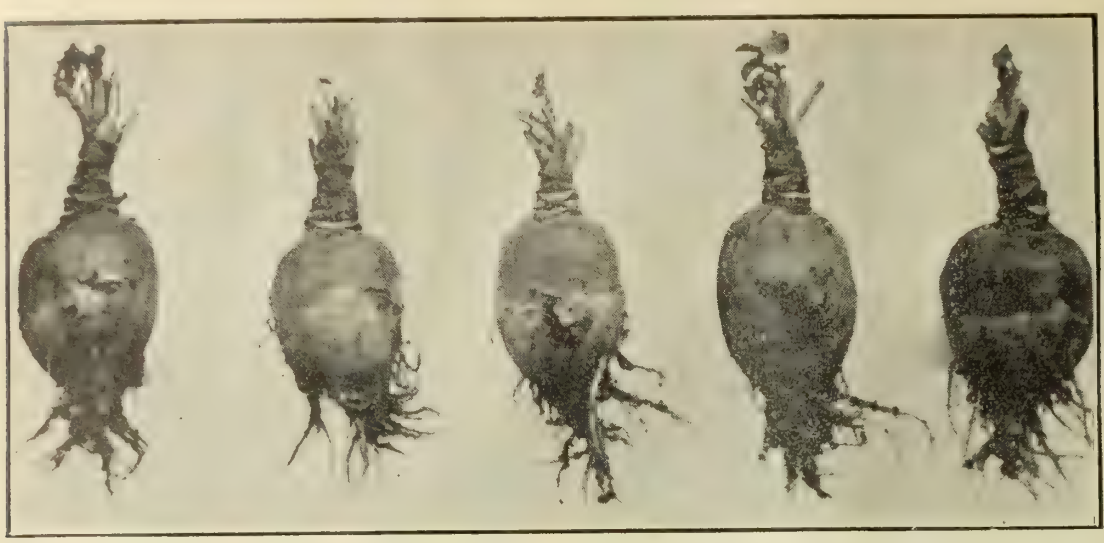
It is very important that the seed be harvested in right time. Very often the field does not ripen quite uniformly, and all the seed on one and the same plant never matures simultaneously. The first formed seed on the lower parts of the seed stalks ripens earlier than the rest, and as this seed is



Good selection of swedes with neat crowns and well confined prongs.



Five Mangels of a good strain of "Yellow Intermediate".



Poor selection of swedes with rough prongs and coarse crowns.

stronger and consequently more valuable than the later formed seed the grower should endeavour to secure it before it falls off. Mangel seed is ready when the true seed inside the brownish cluster shows a mealy surface when cut with a knife. It is time to harvest swede seed when the bottom siliques or pods are getting brown on the outside and the upper ones have attained a yellowish colour.

Where seed is grown in small quantities it is of course possible to dry the seed stalks by hanging them up in a well-aired place in the house or in the barn. In this case a sheet or a tarpaulin should be spread out on the floor so that no seed may be lost. On a large acreage the stalks must be cured in the field. For this purpose the seed-stalks are tied in loose sheaves and left in open stooks until such time as they may be dry enough for hauling to the barn. Here they should be threshed as soon as possible. The seed is cleaned on the fanning mill and with the aid of hand sieves, and is spread out in thin layers which should be shuffled daily until quite dry. Then it may safely be put in bags and stored away.

Conclusion

At Macdonald College and on trial plots in different counties we have grown seed from mangels, swede turnips and carrots during the last years with excellent results as far as quality is concerned and with quite satisfactory, though somewhat varying yields. I have spoken to several farmers in our Province who have been successful with seed growing, especially from swedes. Mr. Lavallée, St. Guillaume, Yamaska, Cy., among others, is quite content to have raised his own swede seed for the last few years. In our neighboring province to the West, the O. A. College at Guelph and the Ontario Seed Co., Waterloo, have produced first class root seed for a number of years; and in 1913 the Dominion Sugar Company, Berlin, Ont. planted over 45 acres with sugar beets for seed purposes. Swede seed production is well known in the Maritime provinces, especially in Yarmouth Co., N. S. where one man has made a success of it for not less than seventeen years. There is thus sufficient evidence that root-seed can be grown in Canada, and the sooner our farmers give it a good trial the better for their own economy and for the commercial balance of the Dominion.

PAUL A. BOVING,

In Charge of Root Crop Investigation,
Cereal Husbandry Department,
Macdonald College

WATER SUPPLY FOR A HOUSE

Editor, Journal of Agriculture:—

MY well is 400 ft. from the house and the kitchen sink is about 6 ft. above the water level in the well. Between the well and the house there is a knoll. If I put the pipe in 4 ft. deep it will be about 3 ft. higher at the knoll than at the house. Will this interfere with the working of the pump? W. J. R., Stanstead.

Ans. We advise you to make your suction pipe downhill all the way from the house to the well. Then your pump will work and you will have no trouble with it. If however there is a ledge of hard rock at the knoll which would be very expensive to cut through you can have this hump in your pipe. The trouble with this arrangement is that air gathers at the highest point and finally stops the suction action of the pump. You will have to let out this air from time to time. To do this have a swing check valve on the suction pipe at some point near the well. Then at the highest point of the hump put in a tee and run a branch pipe up to the surface of the ground. Put a cock in this branch pipe down near the main pipe. When you wish to let the air out of the bend open the cock and pour in water. This is a makeshift and we advise you to put the pipe in right at first if you can.

C. J. L.

Seed-bearing Mangels at Macdonald College.

PUMPING WATER FROM WELL TO KITCHEN

Editor, Journal of Agriculture:—

MY well is 240 ft. from the house. It is 12 ft. deep and there is 8 ft. of water in it. The floor of my house is about 6 ft. above the top of the well. Can I put a pump in the kitchen and lift this water by hand. If so, please tell me the style of pump, the size of the cylinder and the size of the pipe. I may wish to force water into a tank above the kitchen. What style of pump would be needed for this? C. R. Bury, P. Q.

Ans. You can pump your water by hand without any trouble. Get an iron cistern pump, use 1½" galvanized iron pipe, 2½" cylinder; put the pipe 4½ ft. underground to avoid frost. Make the pipe slope from the house to the well. Put a swing check valve on the pipe for 5 ft. from the well. If you wish to lift water above the level of the pump you must use a force pump. Get a good cistern force pump. You will have no difficulty with this outfit. Your total suction lift is only 10 ft. and this is small.

C. J.L.

THE TIDE AND THE FLOWING WELL

Editor, Journal of Agriculture:—

I have a bored well at my farm which is a flowing well. It is down near the river in which the tide rises and falls. I find that it flows better when the tide is in, than when it is out. Can you tell me why this is? Jas. N. B.

Ans. The source of the water in all wells is rain or snow water which has fallen on high ground and flows underground to the neighbouring streams and rivers. In the case of your well the water is coming from the high land above and is flowing into the river. It is doing this all along the river and your well taps this flow only at one point. The water is flowing through tiny channels and crevices. When the tide is out, part water flows through your well and part into the river. When the tide is in, the lower ends of the channels are filled up and the water escapes through them less readily. Thus more water flows through your well.

C. J. L.

HEMP NETTLE

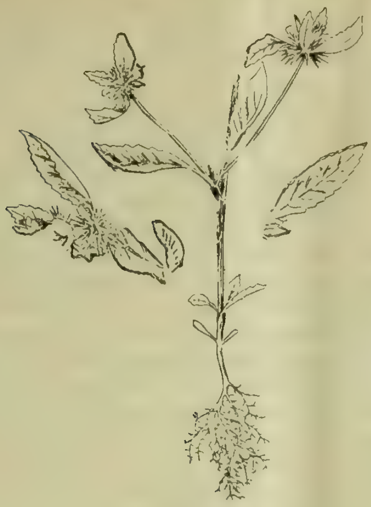
Editor, Journal of Agriculture:—

WHAT is the name of the enclosed weed? It is very common in these parts in our grain fields and is hard to control.

P. S. Scotstown, P. Q.

ANSWER:—

The weed is common Hemp Nettle, sometimes called Bee or Dog Nettle, and Bastard Hemp. It is an annual, that is it springs from seed every year and produces seed the same year. Its seeds ripen late—in September. The accompanying illustration shows clearly its general appearance; its flowers are purplish, white or variegated, and grouped into clusters in the axils of the leaves. The stems are erect, and rough hairy.



Hemp Nettle

Being an annual, it should be prevented from seeding whenever possible. Infested grain fields not seeded down to clover should be disked in early September to cause the seeds to germinate, and harrowed ten days or two weeks later to kill the seedlings. A turnip crop should free infested land. Sow clean seed.

W. L.

JUDGES OF FIELD COMPETITION CROPS IN TRAINING

THE meeting of the Judges of the Field Crop Competitions was held again this year at Macdonald College. As in the past the authorities of the college gave them a most cordial reception, and the hospitality which they offered was very much appreciated by all.

The instructions given by the judges were based particularly on the best manner to proceed in judging crops; and all the points thought of any value in this work, were fully discussed and explained by Prof. L. S. Klinck. The two days spent there, although too short to give the instructors a full opportunity to get a full insight into the details of the work, were nevertheless profitably spent, and the judges, I am positive, had accumulated sufficient information before they left to enable them to give decisions with a good deal of accuracy.

Demonstration of the value of pure seed grain in growing oats on the farm of Mr. A. Langevin, Knowlton.

On the first day their attention was drawn specially to the experimental plots, which furnished us with splendid material to study varieties and all the valuable points connected with them. During the second day we devoted most of our time to the weed question; The identification of the most troublesome ones and the best methods of eradicating them were made the principal topics. As weeds are one of the greatest problems to solve on the farms in the Province of Quebec and one of the points we consider the most in judging standing crops, the major part of the day was spent on that topic. The instructions on the subject given by Prof. L. S. Klinck were greatly appreciated by the judges, as they are all farmers and consequently know the difficulties we have with weeds on the farm.

In the afternoon a class of dairy cows was judged under the direction of Mr. A. A. MacMillan who gave much valuable information. This was followed by a trip about the farm and a study of the system of farming, which is indeed very interesting. The four years' system of rotation, as observed by the judges, shows its superiority and should certainly be applied in Quebec on most of our farms.

The day was closed by expressing their hearty thanks to the College authorities and specially to Prof. L. S. Klinck who has always, he and his staff, been a great help to those judges who have met there every year since the organization of the field crops Competitions, and his leaving the Province of Quebec is very much regretted by them and the farmers in the Province who have met him.

J. A. SIMARD

Judges of the Field Crop Competition in Quebec. Reading from right to left are: Mr. J. A. Simard, Seed Branch Representive, Ottawa, Professor L. S. Klinck, Macdonald College, Messrs. J. H. Tremblay, Nap. Lachapelle, H. Morin, Romuald Cote, Jos. Couture, Jos. Leclerc, Frs. Manceau, M. Honey, E. J. Wood, Louis Lavallée, U. Ouellet, C. N. Lyster, J. C. Simard, L. C. Raymond (absent).

THE EFFECT OF THE WAR ON FERTILIZERS

GERMANY is the only country in which payable deposits of potash salts have at present been discovered. Owing to the war the potash available for use in fertilizers is limited in amount. Fortunately, of the three ingredients which are supplied by artificial fertilizers, viz., nitrogen, phosphoric acid and potash, the last is the one least needed by the majority of our soils and crops. Potatoes certainly need this substance in liberal quantity, and mangels to a lesser extent. But though German potash salts are practically unobtainable, there are other direct or indirect sources of potash in the country. Wood-ashes, unleached, contain from three to six per cent of potash, hard wood giving the higher yield. At the present time thousands of bushels of wood-ashes are being thrown away, largely because their value is not recognized. Besides containing plant food, they also contain a large amount of carbonate of lime, an excellent cure for sourness in soils. Forty bushels per acre, ploughed in during the fall, will give good results during the following year.

Unfortunately alkaline substances, such as wood-ashes and lime, favour the growth of potato-scab, and where this is prevalent we cannot recommend their use for potatoes. However it is a well-known fact that land plaster or gypsum when applied to the soil sets free potash locked up therein. Since acid phosphate always contains gypsum, a rather more liberal use of this fertilizer is advisable, particularly for potatoes. Land plaster may be used alone at the rate of 200 or 300 lbs. per acre early in the spring. Nitrate of soda acts similarly to land plaster in liberating potash. When the potash already in the soil is set free by land plaster or nitrate of soda, it is evident that unless potash is applied directly to the soil at a later date, the soil will decrease in fertility, this being a form of soil mining.

For 1915 we may safely say that the dearth of German potash salts is not of overwhelming importance from the fertilizer standpoint. It is to be hoped that by 1916 either fresh sources of potash will have become available or that export of potash salts from Germany will have been resumed.

H. S. HAMMOND,

Macdonald College

LIVE STOCK

CARE OF THE EWE AND LAMB

THE Live Stock Branch of the Department of Agriculture at Ottawa has issued a very practical bulletin on "The care of the Ewe and Lamb". It constitutes a shepherd's presentation of the details of management of the breeding flock, more particularly during the winter and spring months. It takes up, among other things, parturition, feeding, docking, castration, the raising of pet lambs, and the simple and more serious ailments and accidents met with in the ordinary flock, concluding with a series of paragraphs termed "Leaves from the note-book of a successful shepherd".

The bulletin, which is helpfully illustrated, was prepared by T. Reginald Arkell, who has charge of the Sheep and Goat Division of the Live Stock Branch. It is designated as Pamphlet No. 5 of the Live Stock Branch. Copies are available to those who apply for them to the Publications Branch, Department of Agriculture, Ottawa.

FALL HINTS TO THE SHEEP BREEDER

THE ram is half the flock; the best is none too good.

Don't buy a ram lamb if it is possible to get one older.

Tone your ram up for the fall breeding season by giving him a regular grain allowance. Oats and bran are unsurpassed.

Flush the ewes before breeding. It ensures a larger lamb crop next spring.

A. A. MACMILLAN

FIFTH ANNUAL SALE OF THE STOCK BREEDERS' ASSOCIATION

THE fifth annual sale of pure bred breeding stock of the Stock Breeders' Association of the province of Quebec took place at Montreal on the 9th October and at Quebec on the 14th October. It was attended at both places by about 250 people. At Montreal 152 animals were sold, comprising 46 cattle, 64 sheep and 42 swine. The cattle comprised 29 Ayrshires (20 calves—15 males and 5 females, 5 yearling bulls and 4 yearling heifers), 8 French Canadians (4 calves and 4 yearlings) and 9 Holsteins (6 calves and 3 yearlings). The average selling price was as follows:—

CATTLE.

29 Ayrshires averaged	$71	a	head
8 French Canadian cattle	48	a	head
9 Holsteins averaged	84	a	head

SHEEP.

19 Leicesters averaged	$21.58	per	head
12 Cotswolds "	15.00	"	"
4 Lincolns "	35.25	"	"
4 Oxfords "	18.50	"	"
18 Hampshires "	23.00	"	"
7 Shropshires "	20.00	"	"

SWINE.

13 Yorkshires averaged	$37.00	per	head
16 Chester Whites "	26.00	"	"
4 Berkshires "	25.50	"	"
9 Tamworths "	31.00	"	"

The Quebec Sale comprised 196 animals, namely:—36 Ayrshire cattle (16 bull calves, 7 heifer calves, 5 yearling bulls, 6 yearling heifers, 2 two-years old bulls), 11 French Canadian cattle (4 bull calves, 2 heifer calves, 1 yearling bull, 3 yearling heifers, 1 two-years old bull), 6 Holsteins (1 bull calf, 4 yearling bulls, 1 two-years old bull) 81 sheep and 62 swine.

The average price obtained for the animals was as follows:—

CATTLE:—

36 Ayrshires averaged	$60.00
11 French Canadians averaged	24.50
6 Holsteins "	54.00

SHEEP:—

45 Leicesters averaged	26.00
10 Cotswolds "	21.00
3 Lincolns "	11.00
10 Oxfords "	22.00
6 Hampshires "	17.00
7 Shropshires "	15.00

SWINE:—

25 Yorkshires "	30.00
7 Berkshires "	26.00
28 Chester-Whites averaged	27.00
2 Tamworths "	25.00

At Montreal the average for the cattle was $70 per head; the average for the 64 sheep was $21.28 per head and that for the 42 swine $30.61.

At Quebec the average for the 53 cattle was $52.18 per head; the average for the 81 sheep was $22.63 per head, and that for the 62 swine was $24.72.

It must be said that at both places nearly all of the sheep and swine were young stock.

J. A. COUTURE,

Secretary

DO NOT NEGLECT THE YOUNG CALF

SUCCESS in dairy farming depends in no small measure upon the careful rearing of calves. When the milk produced forms the main source of income and particularly from a city market, winter dairying, as it is quite frequently called, usually proves the most profitable practice for the dairy farmer to follow. Catering to this trade, the farmer as a rule has his cows freshening in the early or late fall depending in his particular case on his fall work. In the event of these conditions being all carefully planned we are practically in the midst of a time when the farmer must exercise extreme care in the very important part of the calf's life.

The care and treatment a calf receives undoubtedly has a great effect upon its future condition, and in view of the fact that modern circumstances necessitate such efficiency in all business enterprises, the dairy farmer must necessarily have each individual in his herd developed and working to it fullest capacity in order to manufacture his article, milk, as cheaply as possible. Agreeing, then, that calfhood treatment affects the development of cows it would certainly be a short-sighted policy to allow the calves and young stock only meagre treatment. Thin, under-sized and stunted calves will result in cows of the same relative value, consequently the time to commence developing the dairy cows for your herd is in their calfhood, immediately after birth.

We must remember that a calf when born, although a member of the bovine species, is nevertheless small and tender, and will respond to kind and proper treatment equally as well as young individuals of any other species. The old saying that the calf should always receive its mother's milk is perfectly true, and as the calf grows and develops any changes in either quantity or quality of feed should be made very gradually. The first milk of the cow after calving is called the "colostrum". It is important to feed this milk to the calf since it seems to act as an excellent stimulant and starts the digestive organs properly. The young calf should receive its mother's milk for at least two or two and a half weeks, and from that time the whole milk should be gradually replaced by skim-milk. The one important ingredient that is lacking in skim-milk is the fat, and experience has shown that this fat can be more economically supplied by the addition of some meal or calf feed rather than feeding the fat as it exists in the whole milk, since there is such a steady market for the butter fat obtained in milk. Substituting whole milk with skim-milk, gradually increasing the amount as the calf grows older and substituting the fat in whole milk by means of the addition of a little calf meal, when properly carried out, makes an economical basis for the feeder to follow.

The earlier the calf is taken from the cow the quicker will it become accustomed to drink from the bucket. Stockmen differ on this subject but it has been found that the calf does equally as well if taken away from the cow immediately. For the first two weeks ten to twelve pounds of milk per day is quite sufficient for a good-sized vigorous calf, while a small calf would do nicely on eight pounds per day. Another very important factor is the temperature of the milk. Nature provides a sweet warm drink to the calf and that should be the aim of the feeder when feeding from the bucket. Nothing will disturb the sensitive digestive organs of the young calf more quickly than to get warm milk one day and cold milk another, or stale-tasting milk one day and fresh sweet milk another. The best results are obtained by regular feeding of rather warm milk, although in the warm seasons and as the calf grows older, milk can be fed a little cooler.

The calf should be allowed to nibble at a little dry grain and hay as soon as it will, but at no time should large quantities of these feeds be put within its reach and allowed to remain there. Sweet wholesome food and timely, careful at-

Good Summer Treatment for calves

tention, always keeping them in a thrifty growing condition, should develop and prepare fall calves admirably for the coming season on grass.

A. R. Ness

DURABLE AND SANITARY FEEDING TROUGHS OF CONCRETE

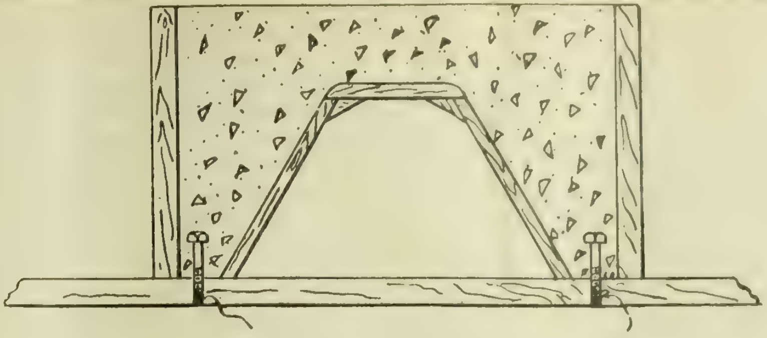
A simple, sanitary and economical use of concrete is shown in the accompanying picture of a feeding trough for hogs. Nothing could be easier than to make troughs of this character for swine or poultry. Old lumber free from splits and knot-holes may be used. To procure an everlasting receptacle of this character simply means the nailing together of two boards in the shape of an inverted V. These are placed on a board platform or other even surface and surrounded with a board frame or form, which is then filled with concrete. The concrete is struck off while fresh to insure an even bottom. No special finish is required and very rude work will answer the purpose. The dimensions of the trough will, of course, depend upon the length and size of the board forms. Small troughs for chickens or large troughs for hogs may be made with equal facility.

Another simple method of making a small trough is to substitute for boards half of a drain tile or terra cotta pipe for the inside form. Where the boards are used it would be well to oil the surface coming in contact with the concrete. This makes the removal of the forms easy. A mixture of 1 part Portland cement, 2 parts sand and 4 parts crushed stone or gravel will make a concrete suitable for this purpose.

To prevent hogs from crowding or getting into the trough, cross pieces should be used as shown. To provide for bolting the cross pieces, holes should be bored in the platform at required intervals and the bolts set in with the thread end down. The bolts should go into the platform to a depth that will insure sufficient projection for the strap iron cross pieces and the nut. The concrete should be a "sloppy wet" mix and thoroughly puddled in the form. It should be kept in the form several days and protected from hot sun and wind. When sufficiently hard on the exposed surface to resist indentation with the thumbnail, the forms may be removed. The concrete should then be sprinkled twice a day for the period of a week.

The strength of a trough of this character will increase with age. It may be easily cleaned and will resist the hardest usage. The longer it is exposed to the weather the more durable it will become.

Concrete Feeding Troughs for Hogs and Poultry



Bolts for Fastening Partitions

UNIFORM SCALE OF POINTS

Showing Excellence in Ayrshire Cattle

As adopted by the Ayrshire Cattle Society of Great Britain and Ireland, the Ayrshire Breeders' Association of the United States, and the Canadian Ayrshire Breeders' Association

SCALE OF POINTS FOR AYRSHIRE BULL

Head		16
Forehead—broad and clearly defined	2	
Horn—strong at base, set wide apart, inclining upward	1	
Face—of medium length, clean cut, showing facial veins	2	
Muzzle—broad and strong without coarseness	1	
Nostrils—large and open	2	
Jaws—wide at the base and strong	1	
Eyes—moderately large, full and bright	3	
Ears—of medium size and fine, carried alert	1	
Expression—full of vigor, resolution and masculinity	3	
Neck:—of medium length, somewhat arched, large and strong in the muscles on top, inclined to flatness on sides, enlarging symmetrically towards the shoulders, throat clean and free from loose skin		10
Fore Quarters		15
Shoulders—Strong, smoothly blending into body, with good distance from point to point and fine on top	3	
Chest—low, deep and full between and back of fore legs	8	
Brisket—light, not too prominent and with very little dew-lap	2	
Legs and Feet—legs well apart, straight and short, shanks fine and smooth, joints firm; feet of medium size, round, solid and deep	2	
Body		18
Back—short and straight, chine strongly developed and open-jointed	5	
Loin—broad, strong and level	4	
Ribs—long, broad, wide apart and well sprung	4	
Abdomen—large and deep, trimly held up with strong muscular development	4	
Flank—thin and arching	1	
Hind Quarters		16
Rump—level, long from hooks to pin bones	5	
Hooks—medium distance apart, proportionately narrower than in female	2	
Pin Bones—high, wide apart	2	
Thighs—thin, long and wide apart in proportion to rest of animal	4	
Tail—fine, long and set on a level with the back	1	
Legs and Feet—straight, set well apart, shanks fine and smooth; feet medium size, round, solid and deep	2	
Scrotum — well developed and strongly carried		3
Rudimentaries, Veins, etc.—teats of uniform size, squarely placed, wide apart and free from scrotum; veins long, large, tortuous, with extension entering large orifices; escutcheon pronounced and covering a large surface		3
Colour-Red of any shade, brown or these with white: mahogany and white, or white; each colour distinctly defines	3	
Covering		6
Skin—medium thickness, mellow and elastic	3	
Hair—soft and fine	2	
Secretions—oily, of rich brown or yellow colour	1	
Style—Active, vigorous, showing strong masculine character, temperament inclined to nervousness, but not irritable or vicious		5
Weight at maturity not less than 1,500 pounds		4
Total		100

SCALE OF POINTS FOR AYRSHIRE COW

Head		10
Forehead—broad and clearly defined	1	
Horns—wide set on and inclining upward	1	
Face—of medium length, slightly dished, clean-cut, showing veins	2	
Muzzle—broad and strong without coarseness, nostrils large	1	
Jaws—wide at the base and strong	1	
Eyes—full and bright with placid expression	3	
Ears—of medium size and fine, carried alert	1	
Neck—Fine throughout, throat clean, neatly joined to head and shoulders, of good length, moderately thin, nearly free from loose skin, elegant in bearing		3
Fore Quarters		10
Shoulders—light, good distance through from point to point, but sharp at withers smoothly blending into body	2	
Chest—low, deep and full between and back of fore legs	6	
Brisket—light	1	
Legs and Feet—legs straight and short, well apart, shanks fine and smooth, joints firm, feet medium size, round, solid and deep	1	

Body		13
Back—strong and straight, chine lean, sharp, and open-jointed	4	
Loin—broad, strong and level	2	
Ribs—long, broad and wide apart	3	
Abdomen—capacious, deep, firmly held up with strong muscular development	3	
Flank—thin and arching	1	
Hind Quarters		11
Rump—wide, level and long from hooks to pinbones	3	
Hooks—wide apart and not unduly overlaid with fat	2	
Pin Bones—high and wide apart	1	
Thighs—thin, long and wide apart	2	
Tail—long, fine, set on a level with the back	1	
Legs and Feet—legs strong, short, straight when viewed from behind and set well apart; shanks fine and smooth; joints firm; feet medium size, round, solid and deep	2	
Udder—Long, wide, deep but not pendulous, nor fleshy; firmly attached to the body, extending well up behind and far forward; quarters even; sole nearly level and not indented between teats; udder veins well developed and plainly visible	22	
Teats—Evenly placed, distance apart from side to side equal to half the breadth of udder, from back to front equal to one-third the length; length 2½ to 3½ inches, thickness in keeping with length; hanging perpendicular and slightly tapering	8	
Mammary Veins—Large, loag, tortuous, branching and entering large orifices	5	
Escutcheon—Distinctly defined, spreading over thighs and extending well upward	2	
Colour—Red of any shade, brown or these with white: mahogany and white or white; each colour distinctly defined. (Brindle markings allowed but not desirable)		2
Covering		6
Skin—of medium thickness, mellow and elastic	3	
Hair—soft and fine	2	
Secretions—oily, of rich brown or yellow colour	1	
Style—Alert, vigorous, showing strong character; temperament inclined to nervousness but still docile		4
Weight at maturity not less than one thousand pounds		4
Total		100

THE LIVE STOCK BUILDINGS AT THE PANAMA PACIFIC INTERNATIONAL EXPOSITION

By I. D. Graham, Assistant Chief, Department of Live Stock

THE buildings prepared for the exhibition of live stock at the Panama-Pacific International Exposition, are widely different from those that have ever been used at any former exposition. At practically all previous expositions the buildings have been built with the idea of farm utility uppermost, while those prepared for the Panama-Pacific International Exposition are built with the exposition idea uppermost.

Heretofore, the stalls have been arranged at right angles to the mangers so that the visitors who passed in the rear of the animals had but a meager chance to see more than the tail end of the animals in their stalls. Except when these animals were led out to the show ring, or for exercise, it was impossible for the visitor to get any adequate idea of their conformation and appearance as a whole.

As one of the chief purposes of the Panama-Pacific International Exposition is educational, and as all departments have been built around this central idea, the Department of Live Stock has been planned along this line, as well as for the benefit of the pure-breeding industries as a whole, and especially for the western states of America, which are, as yet, new and undeveloped in the pure-bred sense. For these reasons, the chief motive of the plans of the Department of Live Stock has been educational; and the placing of these stalls at an angle of forty-five degrees will enable the visitor to see and study the characteristics and points of excellence of the different breeds, and to compare these with each other, and with the different types of the same breed.

At the last great exposition it was found necessary to erect more than fifty different stables to accommodate the exhibits of live stock. Necessarily, these were placed at some distance from the show ring and this arrangement resulted in delay in moving the larger and heavier animals into the show ring.

In the arrangement of barns of the Department of Live Stock of the Panama-Pacific International Exposition, more stall room is afforded in the eight enormous barns which surround the show ring than were afforded by the more than fifty barns at St. Louis. In the arrangement of barns at San Francisco each animal may be led direct from his stall into the show ring; hence there will be no delay in the work of the judges, as the different rings can be changed rapidly and without any delay caused by the animals having to travel long distances. These barns are equipped with every modern convenience and appliances for the comfort of the animals and will be maintained in the most sanitary condition possible under modern methods. There will be no unsightly refuse on view, and no disagreable odors in these stables at any time.

In preparation for the care of these large collections of the different breeds of animals there has been purchased and stored a very large supply of the finest hay, and there is now being prepared about six hundreds tons of very high class corn ensilage — both of which, together with the needed grains, alfalfa and root feeds, which will be in storage in the building especially provided for this purpose, will make any kind of feed readily available for the exhibitor of any class of live stock.

It is not required that the exhibitor shall purchase his feed from the exposition, but this feed will be stored in anticipation of his needs and will be sold to him by the Department of Live Stock without profit.

At the south of the quadrangle formed by the compact locations of the large exhibit stables, will be constructed a dairy cattle building, measuring six hundred feet in length by one hundred and fifty feet in breadth. This building will be equipped with modern sanitary dairy barn appliances of the highest type and latest design. Litter carriers will transfer the litter from the stables to concealed wagons, where it will be immediately disposed of.

The stanchions provided for the cows, and also the stalls, watering devices and mangers will be of the latest and best type. Special pens will be provided for the bulls and also special pens for the young calves. At the same time, ample facility will be given to the visitor for the inspection of all animals, at all times.

There is, perhaps, no phase of the live stock industry which is now attracting a greater amount of attention than the dairy industry and the exhibits of the dairy cattle building, including the building itself; the peculiar arrangement of stalls, the modern and efficient equipment, as well as the quality of cattle shown therein; and the various dairy problems which will be worked out in connection with handling of the milk from these cows in a sanitary manner, their proper food for most economical production, the care of the animals themselves and a full exhibition of the methods of the Medical Milk Commission, will form object lessons of immense interest to the general public as well as of special interest to the practical dairyman.

At the end of this building, and nearby, will be found the silos of several different types which will be filled with corn ensilage. This is done for the double purpose of providing the ensilage to which eastern cattle have been accustomed, and showing the value of corn as an ensilage plant to the dairyman and farmers of the coast and mountain states, where the silo is less in evidence than in the corn belt states.

At the other end of the dairy cattle building will be found the permanent poultry exhibit, which will comprise a building one hundred and thirty by one hundred and fifty feet, in the form of a "T", which is built especially to accommodate the International Egg- Laying Contest, in which entries have already been made from Great Britain, Australia, New Zealand, and a large number of the states of the union, and the Canadian provinces.

The whole of the grounds devoted to the exhibits of live stock are at the extreme west end of the exposition area and include sixty-five acres of the total of six hundred and thirty five acres devoted to Exposition purposes.

These grounds are of easy access by various methods of communication. The exhibits will be delivered inside the grounds and at the unloading chutes in the cars in which they have reached San Francisco, and over the exposition Railroad System.

Close by the large stables, and yet on the bay front, will be located the Congress Hall and office building, in which the official force of the Department of Live Stock will do its work and the many live stock, poultry, veterinary, and other conventions which will hold their annual or special sessions in San Francisco in 1915, will find ample accommodation in the way of a well lighted hall, moving picture apparatus, and other facilities for illustrating lectures and demonstrations needed in such conventions.

There will be special stalls provided for nurse cows, and also there will be an animal hospital for use in emergency cases. In addition, there will be a permanent exhibit made by the American Humane Society, in which the methods of the Society for the Prevention of Cruelty to Animals, and other branches, will be shown; while other exhibits on the grounds of the Department of Live Stock will include milking machines in daily operation, a milk condensing plant, a creamery in operation, a hog motor in which the animal grinds his own feed, and a permanent dog show, in which all prominent breeds of dogs will be on permanent exhibition.

In scope as well as in detail, the plans of the Department of Live Stock of the Panama-Pacific International Exposition are the most comprehensive that have yet been attempted and the results will be of immeasurable importance to the millions of visitors who will come from all parts of the world and who are all directly interested in the question of the food supply, which here finds its best exemplification.

THE DAIRY

LIST OF PRIZES OBTAINED FOR BUTTER

At the Ottawa Exhibition

1st Section

			Points
1st	Prize	Adjutor Servais, 339 Rue Girouard, St. Hyacinthe	98.5
2nd	"	Jos.-E. Pelletier, St. Martin, Beauce	98.
3rd	"	Albert Bourbonnais, St. Polycarpe, Soulanges	97.75
3rd	"	Alfred Loiselle, St. Jean-de-Matha, Joliette	97.75
4th	"	Aldéi Brault, Ste. Sabine, Iberville.	97.5
4th	"	Ovide Wathier, St. Clet, Soulanges.	97.5

2nd Section

1st	Prize	Edouard Fréchette, St. Félix-de-Valois, Joliette	97.5
1st	"	P. Palleson, Calgary, Alberta	97.5
2nd	"	Alfred Loiselle, St. Jean-de-Matha, Joliette.	97.25
2nd	"	William Jackson, Markerville, Alberta.	97.25

WHEY USED IN THE PREPARATION OF SAUSAGES

At the present time all over the world, food prices are increasing to such an extent on account of the war that it will soon be necessary to find substitutes for our main staple foods. This summer the great International Dairy Congress held in Bern, Switzerland, devoted considerable time to the question of using the various byproducts of the Dairy Industry to better advantage. We give here a short review of an approved method by which whey is converted into sausages.

Whey is the least exploited of all the various by-products of the dairy industry; a small quantity is converted into milk-sugar, fat and albumen, but only a small proportion is used as material for human food or drink, the rest is wasted.

The analysis of whey, however, gives a table of contents of considerable nutritive value, as shown below:—

Water	94. — 97.
Fatty matter	0.03— 0.61
Protein,	0.40— 1.34
Sugar,	4.22— 5.45
Ash,	0.47— 1.12
Dry matter	2.90— 8.60

Our forefathers used whey in the form of soup. In Switzerland a special kind of cheese is made from fresh whey, by heating it to 160° F. and adding 2% of sour whey. The temperature is gradually increased to 193° F., and the casein coming to the surface is skimmed off. In this way 100 lbs of whey give 8 lbs of fresh so-called Zieger curd, and 3 lbs in dried condition. The analysis of this Zieger curd shows its high nutritive value:—

Fat	5.—
Protein	19.—
Sugar	4.—
Ash	4.—
Water.	68.—

On the strength of this commercial product, further successful attempts have been made.

The curd obtained in the Zieger curd process is mixed with trypsin, and after decomposition and subsequent evaporation, products remain which resemble beef extract. When the curd is treated with brewer's yeast a material is obtained which is suitable for the preparation of sausages. The same result can be obtained by heating the whey under pressure.

The practical method as used in a few Swiss factories is as follows:—Whey is gradually heated under pressure until a temperature of 130°-140° F. is obtained. At this point yellow-brown flakes of albumen are formed, having a light flavour of burnt sugar. These flakes are strained and pressed to the consistency of bread. This material is mixed with whey to the thickness of syrup, and to every 10 lbs. a pound of finely minced onion is added. This mixture is then put in a press and heated, the pressure reaching 25 lbs. in half an hour. It is again strained, and pressed till it becomes a tough mass. To this is added per 10 lbs. of material, boiled bacon 1 lb. bread crumbs 1.5 lb. salt 2 oz., spice 0.5 oz., fat 1 oz., and a little powdered lemon peel. The whole is thoroughly mixed and filled in skins. The sausages are then boiled for half an hour, and they can be eaten fresh or delicately smoked. It is impossible to distinguish between these whey sausages and the real sausages, which have a big demand, especially in cold weather.

The analysis is as follows:—

	Fresh Sausage.	Smoked sausage.
Water	57.—	48.—
Fat	13.—	19.—
Protein,	16.—	11.—
Other substances,	14.—	22.—

When these sausages are sold at 18 cents a pound, a price which can easily be doubled during the coming winter, the whey has a value of 60 cents per 100 lbs. certainly a splendid return for a waste product.

J. VANDERLECK,
Macdonald College

POULTRY

SHORT COURSE IN POULTRY HUSBANDRY

At Macdonald College, February 15th to March 6th, 1915

Arrangements are being made for the annual Short Course in Poultry Husbandry given by the Poultry Department of Macdonald College.

This Short Course of three weeks is intended to assist in supplying the demand for practical experience combined with a lecture course on the more important phases of poultry culture.

The poultry plant at the College gives good opportunities for the study of the practical side of the industry, and students will be required to do practical work, such as operating incubators and brooders.

The lecture course will supplement the practical work, and will cover the important phases of the business. The sessions will be open for practical discussions. Lectures will be given on related industries.

The course will be full of uptodate information designed for practical poultry keepers and it should enable all interested to become more familiar with the principles of successful poultry culture. For an announcement and particulars address: The Principal, Macdonald College, Prov. Quebec, Canada.

A WORD TO POULTRY KEEPERS

By F. C. Elford, Dominion Poultry Husbandman

The indications are that new-laid eggs will be as scarce this Winter as usual and if extra attention is not paid to getting the laying stock into condition and housed early, the supply of eggs may not be as plentiful even as it was last winter.

Though the present is too late to begin to prepare for early winter eggs, it is a good time to make the best of what we may have by getting everything ready before the cold weather comes. The beginning was made last spring when the early pullets were hatched, for only the early pullets can be depended on to give eggs during November and December. The hens, as a rule, will not lay many eggs until the end of January of February. It is therefore from the well matured pullets that the high priced eggs may be expected and in order to get the most out of these, care must be taken, as from now until laying time is a more critical time in the life of the pullet than most poultrymen imagine.

HOW TO GET READY

1. Keep no stock that will be non-producing. Kill off the old hens that will not lay until the spring. Market the immature pullets and all surplus cockerels as soon as they are ready. Give the rest of the pullets every opportunity to develop and get into laying condition before winter sets in.

2. Put these pullets into their winter quarters, early. The unnecessary handling or changing of pullets from one place to another just when they are about to begin to lay is disastrous and in some cases will retard laying for several weeks. Give the pullets every chance to get acquainted with their winter quarters in plenty of time, and feed liberally so that they will start to lay before the cold weather.

3. Do not feed sparingly but judiciously. Though feed may be high, it does not pay to stint the layers. Feed them grain in a litter on the floor and as the weather gets colder increase the quantity of litter. In addition to the grain see that they have either a hopper, with dry mash constantly before them, or if preferred, give it in the shape of a moist mash once a day. Have the house clean, preferably white-washed, and allow plenty of sunshine in. We have found that with a shed roofed house, a board protection along the front of the house as high as 18 inches from the floor is an advantage; from this up glass and cotton in the proportion of one of glass to two of cotton, make the most ideal front for the average Canadian house.

WHY NOT MORE CITY HENS

Many town and city people could not only produce sufficient eggs to keep their table going, but have enough eggs left over that would go a long way towards supplying the household with groceries, etc. There are comparatively few city lots where a small flock of poultry could not be kept and enough scraps find their way into the garbage can to provide a large proportion of the food. No male birds should be kept as they are both a nuisance and an expense. With no rooster and with the house kept clean and sanitary there is absolutely nothing about such a plant that could possibly annoy the neighbours. If say one in every one hundred city families would produce even enough eggs for their own table, it would reduce the number of those who only consume and add that many more to the list of producers.

CANADA IMPORTED EGGS LAST YEAR

During the fiscal year ending March 31st, 1914, over 11¼ million dozen eggs were imported into Canada. These came from Great Britain, Hong Kong, China, Japan, New Zealand, and United States. Surely Canadian poultry keepers can supply the demand this year. If all help in this matter there should be no lack of eggs, and if care is exercised in the production there should be a good revenue to the producers and the consumer ought not to pay such exorbitant prices as sometimes have been asked in the time of scarcity.

BETTER HAVE THE COST LOW THAN THE SALE PRICE HIGH

Owing to the high price of feed it may cost more this year than usual to produce new laid eggs, but by careful management the average cost of one dozen of eggs might be kept as low as usual. It is at the production end that producers should aim to economize, and it is better to save at this end than to expect extreme prices. This is always the case, and especially will it be so this winter when everything the consumer has to buy will be dear and money to pay for it scarce. It will be a loyal act to study how cheaply the eggs can be produced rather than how much can be charged for them.

Prof. Edward Brown, the Veteran Poultryman of England, made a suggestion the other day to English breeders, which suggestion even from this distance sounds good. He thought that as so many poultry breeders in Great Britain had done business with Belgian poultrymen, who in all probability were killed, or who at least have had all their stock destroyed, that these English breeders, as soon as the smoke of battle had cleared away, might donate to their old customers and friends in Belgium, sufficient breeding stock to enable them to start up again. This suggestion of Prof. Brown's is worthy of a Britisher and though Canadian poultry breeders may not be able to do this, they can show their loyalty by producing as many new laid eggs as possible for this winter and at the least possible cost. Strictly new laid eggs in the winter time are worth a good price and the man who can produce them deserves credit and extra remuneration, but let us hope that this winter, by better care and management we will have enough new laid eggs that we can supply the consumers at a price which is within the reach of those who must have them.

HOWICK SCHOOL FAIR

On Saturday, Sept. 12th. in the Curling Rink, Howick, Que. was held what has been for the last three years an annual event; viz. The Howick School Fair.

Previous to this year the School Fair was held entirely under the management of the Howick Homemakers' Club. This year, however, the club determined to co-operate with the Macdonald College Demonstrator, and a very successful joint fair was held.

The exhibits were entered in two divisions. The Homemakers' Club had distributed seeds of, and offered prizes for carrots, cabbage, asters and scabiosa; the entries in each of these classes were numerous. Another interesting feature of the Homemakers' Club exhibit was the competition between the different schools; the competition in this was keen, the exhibit from Riverfield school finally winning over that from Howick school, whose exhibit won this event last year.

Some of the school boys of Pontiac County who took part in the poultry competition at the School Fair at Shawville, Que.

In the Macdonald College sections, there were fine exhibits of poultry, flowers, potatoes, and corn. In the poultry and flower sections the com- exceptional merit. The judging of the flowers was exceptional merit, the judging of the flowers was done by Mr. A. Walker, and of the poultry by Mr. S. A. Bergey, both of Macdonald College. There was a large entry of potatoes, and a few very well matured samples of corn (Quebec Yellow).

The prizes in the Homemaker's Sections were donated by the Homemakers' Club, which also gave five dollars towards the prizes in the Macdonald College section; twenty-five dollars were given by Macdonald College as prize money in its sections.

An exhibit of Poultry House models, poultry keeper's supplies, cereals, fruit, and vegetables, from Macdonald College, attracted considerable attention.

Over two hundred people attended the fair, and all appeared much interested in the exhibits and in the work generally.

OTTAWA COUNTY HOLDS SUCCESSFUL SCHOOL FAIRS

The exhibit of poultry at the county of Wright Agricultural Society, held at Aylmer, Que., 28th. to 30th. was a surprising success. Last year a school contest was put on, but this year the results were more in advance of what was accomplished the previous year. The chickens exhibited at this fair were hatched from eggs supplied by the Poultry Department of Macdonald College. The work was undertaken in a very energetic manner by Mr. H. B. Jowsey, of Steadman, Que. Nothing was left undone and Mr. Jowsey went to considerable trouble in superintending the extension work in his county. He visited the various schools, county councils, and boards of trade, and enlisted the support of the school children and their parents in this valuable line of work. Schools were selected in Eardley and South Hull townships, and suitable pupils, selected by Mr. Jowsey in co-operation with the respective school teachers, were enlisted to take the eggs and hatch the chicks.

In order to make the competition a success Mr. Jowsey secured donations of $10.00 each from the Eardley and South Hull Councils of Agriculture, which were used in providing a good prize list. The entries were numerous since, with a very few exceptions, all the children who received eggs exhibited their chickens. There were in all 146 chickens, the average number of chickens exhibited by each competitor being 8½. The success of the pupils in the raising of their chickens has been very gratifying. The birds were of very good quality and were almost all well developed.

Results of this line of extension work are due largely to the untiring and gratuitous services rendered by Mr. Jowsey.

COWANSVILLE RURAL SCHOOL FAIR

Large Exhibit of Poultry under the Auspices of Macdonald College

The Cowansville School Fair was held in the Town Hall, Cowansville, on Saturday, October 3rd. Competition was open to the pupils of Cowansville, Sweetsburg, East Farnham, Farnham's Corner, Dunham and Stanbridge East. All chickens exhibited were hatched from eggs supplied by Macdonald College Extension Branch. All potatoes and corn exhibited were also grown from seed supplied by the College Extension Branch. It was the first School Fair ever held in the District of Bedford, and it proved to be a great success. Over 250 people showed their interest in the pupils' work by being present at the Fair.

The exhibits were large, there being 239 chickens exhibited. One exhibitor had 15 chickens from a setting of 15 eggs. Mr. Jull, who judged the poultry, said the birds were especially well developed and that it was one of the best poultry shows in the province. The exhibit of potatoes was large, and many of them were of good quality. In spite of the hard frosts there were some splendid bouquets of flowers. About ten pupils brought in weed collections, and there were some very creditable samples of corn.

The judging was completed about 2.30 p. m., when a short programme was carried out, consisting of speeches. Mr. Jull, who had judged the poultry, told the pupils that the awards were made on the development and vigour of the birds. He mentioned a few of the essential characteristics in the commercial breeds of poultry and in closing he made a few well-chosen remarks on the value of poultry competitions in schools. Mr. J. E. McOuat, of Macdonald College, spoke on "Agriculture in our Rural Schools". His address was appreciated by all. Mr. A. C. Gorham, of Macdonald College, who judged the potatoes and flowers, was the next speaker, and called attention to a few of the points to be kept in mind when selecting potatoes

The Poultry Section of the School Fair held at Cowansville, Que. There were 241 chickens shown and the competition was keen.

WOMAN'S WORLD

STEADMAN HOMEMAKERS' CLUB

STEADMAN, Quebec, Homemakers' Club held its September meeting at the home of Mrs. Thos. Hindman on the 5th. inst. Miss Campbell of Macdonald College was present and assisted in making out the yearly programme and also gave a talk on "The Best and Shortest Ways of doing Housework". At the close of such proceedings as were of interest to the women only, the members of the Farmers' Club, who were holding their meeting in another room, were invited by the ladies to their meeting to listen to the Rev. Mr. Williams speak on "The Cause of the War". Mr. Williams led his hearers far back into the past, and traced the history of the German people up to the present time, and certainly left his audience with a clear understanding as to the cause of this great war.

Steadman Club is to be congratulated on its progress, good officers, willing members and patriotic spirit.

It seems to be a good idea to have the farmers' and homemakers' clubs meet at the same time. The farmers themselves admit that they have a better attendance on this account. When the regular business of each meeting is over, the members of the Farmers' Club join the ladies, tea is served, and a pleasant social hour is spent.

HOMEMAKERS' CLUBS IN PONTIAC COUNTY

THE Annual Meeting of the Pontiac County Club was held in the Masonic Hall at Shawville, October 6th.

Representatives from all the Clubs were present, and Miss S. J. Armstrong presided over the Meeting. After the reception of delegates, the county report and the reports from each branch club were read by the secretary, Miss Pritchard.

Besides the regular reports, each representative was asked to give a criticism of the general work of her Club during the year. This proved very interesting and brought up many points for discussion.

The question of equipping a sewing room in Shawville Academy, should the Government grant be secured, School Fairs and the interests of the village club versus the country club, were well thrashed out and committees were appointed to carry out the resolutions made in respect to these matters.

Miss Campbell, of Macdonald College, addressed the Meeting and expressed herself as well pleased with the progress of the work in Pontiac County.

The officers for the ensuing year are as follows:—

President .. .. Miss S. J. Armstrong.
Vice-President .. .. Mrs. R. W. Hodgins.
Asst. Vice-President .. .. Miss Amy Hodgins.
Secretary-Treasurer .. .. Miss Abbie Pritchard.

HOUSEHOLD SCIENCE EXTENSION WORK IN PONTIAC COUNTY

THE County Club arranged a series of meetings during the week beginning October 5th. in the interests of Club work. Miss Campbell, of Macdonald College, assisted by Miss Pritchard and Miss Amy Hodgins, addressed meetings at Steele Line, Yarm, Murrells, Beech Grove and Quyon. The average attendance was very good and clubs were formed at each of the above mentioned places. The following officers were appointed for each:—

Steele Line

President .. .. Mrs. Jas. Steele.
Vice-President .. .. Mrs. Robt. Hobbs.
Secretary-Treasurer .. . Miss S. Steele.

Yarm

President .. .. Mrs. Robt. MacJanet.
Secretary-Treasurer .. . Miss Ferne Belsher.

Murrells

President .. .. Mrs. Perie.
Vice-President .. .. Mrs. Horner.
Secretary-Treasurer .... Mrs. Hammond Stewart.

Beech Grove

President .. .. Mrs. Robt. Hammond.
Vice-President .. .. Mrs. C. Taber.
Secretary-Treasurer .. . Miss Irma Mohr.

Quyon

President .. .. Mrs. W. A. Dickson.
Vice-President .. .. Mrs. Pimlott.
Secretary-Treasurer .. . Mrs. Davis.

The following is a list of Clubs now formed in Pontiac County:—

Shawville.
Wyman.
Bristol.
Elmside.
Austin.

---

for exhibition purposes. Mr. E. A. Lods, the new Demonstrator for Cowansville, who had judged the corn and weed collection, referred to the work he intended to carry out during the coming season. Inspector Taylor and the Rev. Mr. Plaisted spoke on the value of School Fairs to the pupils.

It was very encouraging to those who had charge of the School Fair to see the interest which the parents showed. Competitions in poultry and potatoes are proving to be one of the best ways of getting the children interested in agriculture.

The following is a list of the pupils who won prizes:—

Poultry, largest and best lot:—1. Wesley Fitchett, 2. Hazel Heslam, 3. Mary Hall, 4. Clifford Rhicard, 5. Alex Watson, 6. Clara Horner.
Best Five:—1. Carl Wescott, 2. Clare Mooney, 3. Gordon Kittell, 4. Roy Callaghan, 5. Helen Beach.
Best Three:—1. Arthur Phelps, 2. Ina Basmar, 3. Dwight Drew, 4. Aileen Rogers, 5. George Stevens.
Best Cockerel:—1. Hazel Heslam, 2. Roy Callaghan, 3. Mary Hall.
Best Pullet:—I. Ina Basmar, 2. Charlie Norris, 3. George Miltimore.
Potatoes, Best eight:—1. Carl Covey, 2. Percy Whyte, 3. Clara Horner, 4. Hugh Strange, 5. Clarence Martin.
Best Peck:—1. Carl Covey, 2. Percy Whyte, 3. Hugh Strange, 4. Clara Horner, 5. Louise Royea, 6. Clarence Martin.
Flowers, best bouquet of Asters:—I. Ina Basmar, 2. Mildred Chadsey, 3. Helen Dalgleish.
Best Bouquet of Phlox.:—1. Kate Wescott, 2. Mildred Chadsey, 3. Stuart Hodge.
Best Collection of Noxious Weeds:—1. Beth Cooke, 2. Clara Horner, 3. Gladys Basmar, 4. Mary Hall, 5. Helen Beach.

The School Fair was in charge of W. G. MacDougall.

AYLMER SCHOOL FAIR

THROUGH the courtesy of your Department (Poultry Dept, Macdonald College), I obtained twenty-five settings of eggs which were distributed among the pupils of schools in the surrounding district.

Each pupil, before receiving the setting of eggs signed a declaration that "he or she" would take good care of the resulting chickens, and show them at the School Fair in connection with Aylmer Fair Sept. 29-30.

There were seventeen entries at the School fair out of the twenty-five pupils who had received settings.

The number of chickens totalled 140 giving over 50% of the eggs hatched that were received by the pupils.

The children who did not show, either were unsuccessful in raising any chickens, or their stock got mixed with other poultry while small, and were difficult to select.

I only found one case where a pupil was not concientious, and exhibited more poultry then was raised from the setting.

The money given to the pupils in prizes was collected by myself privately. In February, I interviewed the South Hull Council and they voted me $10.00 towards prizes in the Poultry Competition, providing the different schools in that locality were favored in the distribution of settings of eggs.

The Eardley Council again favored the Competition by granting $10.00 towards the prizes this year.

I am pleased to report that since this work has been begun in this district, there has awakened a deeper interest in poultry among both young and old. I expect to form an adult Poultry club in and around Aylmer this coming winter.

The Prize Winners were as follows;

For the largest and best flock

Everett Price, Tower View P. O.
Marjory Foran, Aylmer P. O.
Mary McConnell, Aylmer P. O.
Charles Cook, Simmons P. O.

Best Pen of Five Birds

Ralph McConnell, Rochon P. O.
Wilton Benedict, Rochon P. O.
Lillian Edey, Aylmer P. O.

Best Trio of Birds

Violet Farris, Aylmer P. O.
Stella Hetherington, Heyworth P. O.
Chester McMillan, Hull P. O.
Stewart Dowd, Eardley P. O.

Best Pair of Birds

Eva Breckenridge, Heyworth P. O.
Wyman Lusk, Luskville P. O.
Horace Nugent, Hull P. O.
Mary McConnell, Aylmer P. O.

Best Cockerel

S. Hetherington, Heyworth P. O.
V. Farris, Aylmer P. O.
E. Breckenridge, Heyworth P. O.
Fred. McConnell, Aylmer P. O.

Best Pullet

Marjory Foran, Aylmer P. O.
C. Cook, Simmons P. O.
E. Price, Tower View P. O.
Clayton Phelps, Tower View P. O.

Best Prepared Bird for Show

F. McConnell, Aylmer P. O.
E. Breckenridge, Heyworth P. O.
Mary McConnell, Aylmer P. O.
H. Nugent, Hull P. O.

Special for Long Distance Exhibitor

Stewart Dowd, Eardley P. O.
Drove 15 miles to exhibit his poultry.

In all, the total prize money this year amounted to sixteen dollars and sixty-five cents.

HARRY B. JOWSEY,

Extension Branch, Poultry Dept.
Macdonald College
Steadman, P. Q.

Starks Corners.
Steele Line.
Yarm.
Murrells.
Quyon.

Miss Campbell takes this opportunity of thanking those people of the county who so kindly entertained her and aided her in the work during these meetings. The path of the demonstrator is certainly made pleasant in Pontiac, where interest is manifested in every good work.

In Quyon the night of the meeting was dark and rainy and many obstacles (as the ladies will remember) presented themselves, but the ladies of Quyon overcame them all to form a Club and begin the patriotic work "For Home and Country".

HOMEMAKERS' CLUBS IN COMPTON COUNTY

THE Cookshire Homemakers' Club has been making an effort to extend the work in its county. Meetings had been arranged at Angus, Megantic, Waterville and Sawyerville. At Angus, Miss Campbell addressed a large number of ladies, at the home of Mrs. Bothwell, but as they had already started a Patriotic Club that evening, they naturally felt they could not consider a Quebec Homemakers' Club for the present. The meetings at Megantic and Waterville were cancelled, owing to Patriotic Meetings being held there. The meeting at Sawyerville was held on October 1st. and was addressed by Mrs. Kirby, President of the Cookshire Club, and Miss Campbell of Macdonald College. The ladies of Sawyerville preferred to organize a Quebec Homemakers' Club and carry on their patriotic work through it. The following officers were appointed:—

President. Mrs. Richard Montgomery.
Vice-President, Mrs. Hurd.
Secretary-Treasurer. Mrs. Chattock.

The three Clubs now formed in Compton County are:—Cookshire, Canterbury and Sawyerville.

FOODS AND FOOD PREPARATION

Lesson X

CEREAL BREAKFAST FOODS

(Miss Fisher's contribution to our October issue, entitled "The Canning of Fruits and Vegetables", constitutes Lesson IX of this series. Ed.)

THE cereal grains hold a place in the front rank of human foods. This is due to the fact that they are cheaply and easily grown in almost all parts of the world; that they can be kept for long periods; that they contain all the food principles necessary to nourish the body; and that, if properly prepared, they are palatable and easily and completely digested.

Kinds of Breakfast Foods

The grains commonly used in preparing breakfast foods in this country are oats, wheat, corn, barley, rice and buckwheat. The foods prepared from these may generally be divided into four classes:—

1. Uncooked—granulated forms of oatmeal, wheat farinas, cornmeal and rice.
2. Partially Cooked—rolled oats and flaked grains.
3. Cooked—corn flakes, shredded wheat, biscuit, etc.
4. Malted and Cooked—force, malta vita.

The various processes of making these different kinds of foods cannot be gone into in this lesson, but the subject is interesting and it is recommended that the Clubs make study of it in connection with this lesson.

There are so many kinds of breakfast foods now on the market, that a choice is almost bewildering, but in general it may be said:—

1. The various foods agree in composition with the grains from which they are made.
2. The ready-to-serve foods contain more soluble matter than the uncooked wheat oats and corn meals, but *when the latter are cooked they are more soluble than some of the former.*
3. The digestibility of the various food principles of the different kinds of foods does not vary widely. Proteins vary most in this respect and are least digested in the ready-to-serve foods.
4. The carbohydrates or starch of the so-called "predigested" foods are no better digested than those of other foods.
5. Foods purchased in packages are much more expensive than those bought in bulk.
6. The older forms of breakfast foods, especially when sold in bulk, are among our cheapest foods.

It is often argued that foods put up in packages are cleaner, but the competition resulting from so many package goods being put on the market has forced manufacturers of other lines of breakfast foods to be more careful of the quality and cleanliness of their products and the housekeeper need not hesitate to use the breakfast cereals which are done up in sacks. It is as well to know something of the package and not to buy merely on the strength of appearance.

Composition

The general composition of cereals is as follows:—

Water	10—12%.
Proteins	10—12%.
Carbohydrates	65—75%.
Fats	½— 8%.
Mineral Matter	2%.

Table showing the relative richness of each cereal in the different food principles

Protein.	Fat.	Carbohydrate.	Mineral Matter
Oats.	Oats.	Rice.	Barley.
Wheat.	Corn.	Rye.	Buckwheat.
Buckwheat.	Buckwheat.	Wheat.	Oats.
Rye.	Rye.	Barley.	Rye.
Corn.	Barley.	Oats.	Corn.
Rice.		Oats.	Rice.

It will be seen from the above table that Oats is richest in tissue—building material and fat, rice in energy—giving material, barley in mineral matter, and so on. The mineral matter contained in cereals is largely salts containing *phosphorus* and *lime.*

It is to be regretted that so many children today refuse to eat "porridge" for breakfast. Toast and tea cannot take the place of oatmeal porridge and milk. While the white flour retains all the original energy—yielding ingredients and most of the muscle—building materials, it has lost in the milling process the substances in the outer layers, which keep the intestines clean and which help in *bone-building, tooth-forming* and in the *making* of *red blood corpuscles.*

If the breakfast cereal is properly cooked and daintily served there should be very little, if any, difficulty in getting children to eat it.

Digestibility

Thorough cooking is a factor which has a bearing upon digestibility. It not only makes the cereals more palatable, but it breaks down the walls of indigestible cellulose which surround the starch grains and other nutrients so that the digestive juices can work on the food principles more effectively.

Methods of Cooking

Although so commonly used, the breakfast cereals are often very poorly prepared. "Porridge" too thick or too thin, or worse still, scorched or with a taste of uncooked starch, is far from palatable. The consistency should be soft and jelly-like. The following rules, if carefully followed, will give satisfactory results:—

A. General Rules for Cooking Cereals in Double Boiler:—

1. *Proportions*

Kind of Cereal.	Quantity Dry Cereal.	Water.	Salt.	Time of Cooking.
Granular Cereals.				
Cornmeal	2½ tblsp.	1 c.	⅓ tsp.	4 hours.
Farina	do.	1 c.	do.	2 hours.
Cream of Wheat	do.	1 c.	do.	do.
Hominy	do.	1 c.	do.	do.
Flaked Cereals.				
Rolled Oats	¼ c.	1 c.	⅓ tsp.	2 hours.
Rolled Wheat	¼ c.	1 c.	do.	do.
Whole or Cracked Grains.				
Rice	⅓ c.	1 c.	⅓ tsp.	½ to ¾ hours.
Oatmeal	do.	1 c.	do.	do. 3 hours.
Cracked Wheat	do.	1 c.	do.	do.

2. *Method*

a. Put the salt and water (boiling) in upper part of double boiler. When it boils again, sprinkle in the cereal gradually and stir constantly until it thickens. Place in the lower part of the double boiler—which should be one-third full of water—and cook as specified above, *without stirring.* Be careful that the lower part of the boiler has always water in it.

b. The cereal should be cooked the day before and reheated next morning. Do not stir cereal until it heats. If too thick stir in a little hot milk to make it of proper consistency.

c. When putting cereal away for the night, cover top with a *thin* layer of water. Pour this off next morning.

d. Enough cereal may be cooked for two mornings for a small family and that left over the first morning put away in an enamel or granite bowl and covered with a thin layer of water. Reheat by placing bowl over double boiler.

B. *Cooking in Fireless Cooker*

Prepare cereals as directed above, but instead of finishing the cooking in a double boiler, place the cereal in a fireless cooker over night.

C. *Quick Method for Cereals*

Put salt and water in a saucepan. When it boils sprinkle in the cereal gradually, stirring constantly. Continue stirring until it thickens. If using a coal stove draw cereal to back of stove and let it simmer for an hour. If using gas stove let it simmer over an asbestos mat with flame turned low. This method has disadvantages compared with the double boiler or fireless cooker method. It requires more attention and the cereal adheres to the bottom of the saucepan making it difficult to clean.

Rice (Cooked as a Cereal)

Wash rice in a strainer. Place strainer over a bowl of cold water and rub rice between fingers. Lift strainer from bowl and change water. Repeat process until water is clear.

Put salt and water in upper part of double boiler. When water boils rapidly, add rice gradually. Boil rapidly five minutes. Cover, place in lower part of boiler and steam forty-five minutes, or until kernels are tender. Uncover, that steam may escape. *Do not stir rice while cooking.* When rice is steamed for a simple dessert, use one-half quantity of water given in recipe and steam until rice has absorbed water, then add hot milk for remaining liquid.

Rice Croquettes

½ c. Rice.
½ c. boiling water.
1 c. scalded milk.
½ teasp. salt.
2 egg yolks or 1 egg.
1 teasp. butter.

Wash rice and cook in milk and water in a double boiler as directed above. Remove from fire and mix in the other ingredients. Spread on a shallow pan to cool. Shape in balls or cylinders. Egg and crumb, and fry in deep fat. Serve garnished with cubes of jelly. For sweet croquettes add 2 tblsp. powdered sugar and rind of ½ lemon to rice.

GRUELS

General Recipe for Gruels

A gruel may be prepared by making any breakfast cereal according to above directions using one half the quantity of dry cereal. When cooked and while hot rub through a strainer and add ½ cup hot milk. Be careful not to make gruels for a patient very sweet. The patient will tire of them.

Rolled Oats Gruel

¼ c. rolled oats.
2 c. cold water.

Mix ingredients in a bowl and soak one hour stirring occasionally. Strain through a fine sieve. Stir constantly over the fire until it boils. Cook over hot water for fifteen minutes. Thin down to required consistency with rich milk. Season to taste with salt, sugar and a little grated nutmeg.

Note:—The quick method given for cooking cereals is not to be recommended for general use. Long cooking at a low temperature is much more satisfactory in every way.

F. CAMPBELL

THE CHILDREN'S HOMER

IX.

THE siege of Troy, after Hector's death, went on, with much fighting close around the walls, but still the city held out, although, lacking Hector, the Trojans could no longer drive back the Greeks.

Achilles, of course, was the chief hero of the Greeks. Penthisilea, Queen of the Amazons, a band of strange warrior women, who came to help Troy, fought a long, fierce battle with him, but in the end he conquered and slew her, and then was sorry when he took off her helmet and saw how beautiful she was.

Memnon, too, son of Aurora, the dawn goddess, and the mortal, Tithonus, who was king of the Ethiopians, the great, black men from Egypt, was slain by Achilles. But at last it came Achilles's turn to die.

You remember that Thetis, the sea-goddess, was the mother of Achilles. When he was a baby she was permitted by the gods to dip him into the Styx, one of the strange rivers of the lower world, in order that he might be invulnerable, and so immortal; but she had held him by the heel, and forgotten to cover that one spot where she held him, with the river water. Therefore, when Paris, one day, from the Scacan gates, shot Achilles with a poisoned arrow, wounding him in the heel, he died. That was a terrible grief to the Greeks.

Soon after, Odysseus went and brought Neoptolemos, Achilles's young son, to the war, and then the Greeks made a great plot to take Troy. For Odysseus said if they could not conquer by force, they must by guile.

Some distance from the city, they built an immense wooden horse with a hollow body. Concealed in this hollow body they left a small band of their bravest fighters, Odysseus, Ajax, Neoptolemos, and others. Then the rest all went away to their ships, leaving the horse standing there on the plain, and pretended to sail off home to Greece. Really, they hid themselves in the woods of Tenedos, an island not far from the shore.

The Trojans, when they saw that the Greeks seemed to be gone, came curiously out to examine the wooden horse. For a long time they could not decide, either what it was for, or what to do with it. Some wished to burn it at once, but others thought it would be a fine trophy of victory over the Greeks and wished to set it up in the city as a memorial of the Trojan success.

These latter finally had their way, and the foolish Trojans actually made a breach in their walls to get the big horse into the city. That night they feasted and made merry, and at length went carelessly to sleep.

When all was quiet the hidden Greeks came out of the horse's body, opened all the city gates to their comrades, who had come back from Tenedos, —and Troy was taken at last.

Priam was killed and many, many other noble Trojans, but a few escaped, and fled from the city, among them a nephew of Priam, named Aeneas, whose adventures the great Roman poet, Vergil, has told.

Cassandra, Priam's prophetess daughter, was taken captive by Agamemnon, and died in Mycenae.

But Andromache, Hector's wife, escaped and lived a long time in another land, sad, perhaps, but still not a slave "to the proud dames of Greece" as Hector had feared.

Some say that the wooden horse story is not true, but that Helen, tired of Troy, opened the city gates to the Greeks, but most people do not believe this of her. She, at any rate, was taken home safe to Sparta by Menelaos, and her one daughter, Hermione, was married to Neoptolemos.

Many of the Greek ships were scattered by storms on the journey home, and of all the strange adventures of the returning kings who had gone to Troy, the strangest were those of Odysseus, who wandered a long, long time, before he came back to Ithaca, the little, rocky island, where Penelope, his wife, and Telemachus, his son, were waiting for him.

Homer's other book, you remember, is named the Odyssey, and it is the tale of these wanderings of Odysseus, after the fall of Troy. Next time I will begin to tell you Homer's story of Odysseus.

MARGARET GRAY

MISTRESS MARY SHAKESPEARE AND HER FAMOUS SON

THE year 1916 will see the ter-centenary of Shakespeare's death. His name will be on everybody's lips. Magazines and newspapers will abound in articles critical and appreciative regarding his works. Suggestions as to the putting up of some lasting memorial in the great dramatist's honour will be rife. And new and sumptuous editions of his works will probably be published when the English-speaking race rises in a body to do homage to its greatest poet.

Analysis of Shakespeare's dramas may be safely left to these coming critics. But at this present moment it may be interesting to glance very briefly at the more ordinary aspect of the poet's life, at Shakespeare in the midst of home surroundings. Though to certain readers it might be pleasing to know something definite of the relations of the great poet to his mother, our information in this respect is very meagre. By degrees, however, certain facts have come to light which help us in imagination to piece out a fairly correct picture of the Shakespeare family.

As far back as the days of Bosworth Field, a Shakespeare is reported in the annals of England as fighting valiantly for King and country. Later his descendants with others of the name are spoken of as being of a "good reputation and credit". Coming on to John Shakespeare, the poet's father, the fact is now generally accepted that he was a glover and small landholder in Stratford town, which was at that time a small community of about 1400 souls. That he was a man of sturdy and commanding character is shown by the record that he was successively appointed by his townsmen to one civic office after another, till he reached the highest in their power to bestow, that of Bailiff or Chief Magistrate. That he was possessed of some or much personal attraction would seem likely. His social position as a yeoman was distinctly lower than that of the maiden of his choice, yet he successfully wooed and won to be his wife, Mistress Mary Arden, the youngest daughter and heiress of Robert Arden, a member of one of the finest and oldest families of the County of Warwickshire.

Mistress Mary's inheritance would be considered a modest one to-day. It consisted of about sixty acres of "arable and pasture" and a house. And a treasure indeed would picture or description of that house be at the present moment. Placed in the midst of a well-wooded country we may assume it to have been a quaint well-timbered building.

But if the exterior of Wilmecote Manor must be left to fancy a revealing glimpse has been afforded us of its interior. In the inventory of Robert Arden's possessions taken after his death, we find the following articles noted: Table-boards, forms, cushions, benches and one cupboard in his hall; painted cloths (tapestries probably) in the hall and chamber; seven pairs of sheets, five board-cloths, and three towels, one feather-bed and two mattresses with sundry coverlets and articles called canvasses, three bolsters, and one pillow. From the same source we find that his kitchen was furnished with four pots, four pans, four candlesticks, a basin, a chafing dish, two caldrons, a frying pan and a gridiron. In comparison with modern kitchens it sounds a meagre outfit, but it was one that in those days stood for a liberal and much appreciated hospitality.

Meagre as it was within, outdoors there was a goodly collection suggestive of generous living. Here the list runs glibly on, reporting oxen, bullocks, kine, weaning-calves, swine, bees, poultry, wheat in the barns, barley, oats, hay, peas, wood in the yard, horses, colts, carts, and ploughs. And here in the midst of her small heritage, a lonely but doubtless winsome figure, stands Mistress Mary Arden in the troubled autumn of 1556. There was much about her that must have been sweet to her eyes, in the green fields and in the shady glens dotting the magnificent woods by which her little estate was surrounded. Yet in the midst of this sweetness there was much to distress the heart and bewilder the mind of an unprotected girl. Persecution was at work in those days of dread memory. Fiery argument and religious quarrels were probably rife in those last embittered years of Queen Mary—years when however brave a young woman might be she must have been the better of a manly protector. Mistress Mary, it is true, had many stalwart kinsmen—cousins stout of arm and heart among the Ardens of Kingsbury. But rough roads and rougher times made interchange of visits difficult, and so, through that first winter of her loss, she must have passed many lonely and apprehensive days till their monotony came to be broken by the visits of a plain and sturdy young yeoman from Stratford town, one John Shakespeare, an able protector for any maiden.

As the days were on no doubt his visits multiplied. However bad the roads, the three miles intervening between Wilmecote and Stratford would naturally seem but a step to the strapping

OF GENERAL INTEREST

FOR ALL WE HAVE AND ARE

(By Rudyard Kipling)

For all we have and are,
For all our children's fate,
Stand up and meet the war—
The Hun is at the gate.

Our world has passed away
In wantonness o'erthrown;
There's nothing left to-day
But steel, and fire, and stone.

Though all we know depart,
The old commandments stand;
In courage keep your heart,
In strength lift up your hand.

Once more we hear the word,
The strickened earth of old,
No law except the sword
Unsheathed and uncontrolled.

Once more it knits mankind,
Once more the nations go
To meet and break and bind
A crazed and driven foe.

Comfort, content, delight,
The ages slow-bought gain,
They shrivelled in a night,
Only ourselves remain

To face the naked days
In silent fortitude
Through perils and dismays
Renewed and re-renewed.

Though all we made depart,
The old commandments stand,
In patience keep your heart,
In strength lift up your hand.

No easy hopes or lies
Shall bring us to our goal,
But iron sacrifice,
Of body, will and soul.

There's but one task for all:
For each one life to give.
Who stands if freedom fall?
Who dies if England live?

---

yeoman with the glimmering image of sweet Mistress Mary ever beckoning him on. One can well imagine that the evenings found him earlier and oftener seated on one or other of those wood benches in the tapestried hall, if only for the pleasure of watching the firelight playing on the girlish face and form of its solitary young mistress—till that memorable evening arrived, when the worship in the young man's heart found fitting expression in words, and the troth of Mary Arden and John Shakespeare was plighted.

No record of their marriage has yet been forthcoming. It probably took place about a year after Robert Arden's death, as the Stratford Register records the birth of a daughter to John and Mary Shakespeare, one baptized Joan on September 15th, 1558. Such fragments of knowledge as we possess regarding the young pair would indicate that they lived very simply. No mention is made of the occupations of the young wife, but it is safe to picture John Shakespeare as punctually present on market days or at the Fair, "either on horseback or with his team, disposing of his carcasses, or wood, or wool, or skins", the produce alike of his own lands and her farms. The house in the little rural town to which her husband brought her may have seemed cramped quarters to Mistress Mary after her country home. But whatever its disadvantages, it possessed at least the supreme advantage of being the home of the husband of her heart, the one with whom she had cast in her lot for good and all.

Bare as are the records of parish registries, they reveal much that stands for joy or sorrow. At the end of four years, during which time it seems that the little daughter Joan must have died, a second daughter named Margaret was born. But hers was a frailer life still for it fluttered out in the short space of six months. It was then to a lonely household, and to hearts doubly bereaved, that in the spring of 1564 new happiness was given, when there was born to the Shakespeares their eldest son, "Will", whose presence must have come like a burst of sunshine to the darkened home.

One shudders still at the threatening shadow by which that sunshine was accompanied, when from the following June to the end of the year Stratford was ravaged by the Plague. Truly indeed must the heart of Mistress Mary have trembled for her infant son, and slender indeed must have been the thread upon which his young life hung. For within those six dreadful months a sixth of the population of the little town was buried—two hundred and thirty-eight in all. Down street after street of the little straggling settlement, door after door, we are told, bore upon its face the terrible red cross and arresting inscription "Lord have mercy upon us".

Happily for the English-speaking race, as for his mother, the baby Shakespeare was spared.

Precious it certainly would be to know something of the intercourse that followed between Mistress Mary and her boy. At best we can only conjecture. Dear indeed to his mother must have been the "shining morning face" of this eldest son as she watched him trotting on his way to his first "primary school". Absorbing would be the story of his doings at the Grammar School to which he was promoted later. On market-day he would probably accompany his father to the market-place, picking up for himself a knowledge of commodities and characters which was to stand him in good stead in later days. But at the yearly Fair his joy would be deepenned by the sharing of it with his mother. In fancy one can see them yet, bending together over the pedlar's glittering wares, displayed especially to tempt the women-folk and youngsters; or standing hand in hand, listening, delighted, to some strange troubadour infantastic costume, singing his quaint, melodious ballad, or relating some wondrous tale of the doings of famous London town, or of the habits of those strange countries now visited by English sailors. No doubt they wondered as they passed the ever-present juggler, perched up on a barrel-top the better to display his marvels, and laughed in concert at the clever tricks of his performing ape.

It is likely, too, that together in spring they watched the dragging out of the plough to the music of the pipers, and later the raising of the May-pole surrounded by its merry maskers, the lad himself as he grew taller and more able dancing in the garb of Robin Hood or Little John around the rose-trimmed pole. She may even have been persuaded by her eager boy to join him on some Easter morning in the customary procession to see the sun dance on the hilltop. In his turn the eldest son would naturally help her on all home occasions, such as the storing up of fruits and nuts and corn in autumn and the preparing of Christmas cheer.

SYLVIA

(To be continued)

THE ISOLATION OF FARM LIFE

(Continued from the October issue)

For the ignorant the isolation of farm life is very real, for they are largely dependent upon association with others of their kind for amusement and recreation. The intelligent, educated man needs a certain measure of this companionship, but he is not so thoroughly dependent upon it. His partial isolation throws him back upon himself for entertainment and the employment of his faculties, and reading and study become a large part of his life.

Agriculture means something more than the mechanical plowing, planting, and harvesting. It brings its best returns when this is intelligently done by the man who thinks and who knows the why and the how of what he does. That is why the educated man whose education is founded on common sense will succeed on the farm where the ignorant man will fail. He has time to study and think, and learns how to apply his own thought and the ideas of others to his every day farm operations. He will live on the farm and be content, for he is accomplishing something.

The isolation of farm life is a problem we are all interested in, but in removing it let us have a care that we do not destroy the very thing we hope to see strengthened.—*Hoard's Dairyman.*

NATIONAL CO-OPERATIVE FARM ACCOUNTING

THERE is much agitation for rural credit. The best suggestions call for a nation-wide system. I presume such a system would call for a large central administration, or head office, with provincial sub-offices, which in turn would have other smaller district offices directly in touch with the business of the individual farmer.

Farming is in need of cheap money, but it is even more in need of an efficient and cheap system of account-keeping.

Beyond the mere recording of items, it requires trained skill to keep complicated accounts properly.

Farm accounting is very complicated when properly done.

It is out of the question to expect the average farmer to keep his own accounts. This must be done by experts.

Expert clerks and accountants cost money, but is costs still more to try to get along without them.

Why not have a nation-wide system of farm accounting and run it in connection with the national co-operative farm credit system?

Briefly, the idea of national co-operative farm accounting may be summed up as follows: Blank sheets supplied to each farmer and items of all things affecting profit or loss on the farm recorded by trained clerks and then interpreted in terms of profit or loss by the accountant. (The farmer could then know what lines were paying and what were not) . The items of importance for each district could be sent in to the provincial office, where conclusions of provincial importance could be drawn, and then further reports, national in importance, could be sent in to the central national administration. Then conclusions of nation-wide importance and even of international importance could be drawn. Besides, just think what an efficient agricultural census would then be possible.

L. D. McCLINTOCK,
Macdonald College Demonstrator,
Cowansville, Que.

THREE REASONS FOR LIVE STOCK

THERE are at least three good reasons why stock raising represents a higher form of agriculture than does grain raising. The first one which comes to mind is that it enables the farmer to retain the fertility in the soil, the result being that it grows more productive from year to year. The second reason is that the financial risk is eliminated to a much greater extent when part of the farmer's income is from live stock. Pastures have never been known to fail entirely in the Central West and so it is always possible, where stock is kept on the farm, to make ends meet by marketing animals that have been cheaply raised on grass. On the other hand, when grain alone is depended upon, sometimes the crop is an entire failure, the result being financial embarrassment.

The third reason why stock raising should be encouraged and the selling of grain discouraged, is that it requires a higher kind of ability. The judging, buying, feeding, breeding and rearing of live stock, if done successfully, require a high type of intelligence. Those who are conducting farms on a live stock basis, and especially those who have undertaken the rearing of purebred classes, are always endeavoring to excel former efforts. In the animal industry few men are satisfied with their past or present efforts. A study of the animals they have on hand at any one time reveals many weaknesses. They see where improvements can be made and immediately endeavor to correct faults by the introduction of still better blood. This leads them to the study of the principles of breeding. This in turn sharpens the judgment so that in a short time persons in business with the intention of doing better become expert judges. This is why men who deal in improved stock are equal in intelligence to any that may be selected from other walks of life. It is not so with the grain man. His outlay is small and his income is not large, the result being that he is obliged to work on small margins. The fact that the supply of fertility in the soil is constantly waning under the grain system compels the occupant of the land to become more and more economical, with the result that his last stage is worse than the first. Progress is the watchword of the stockman. In the growing of animals he is obliged to study their diseases, so that he finally becomes a student of physiology and anatomy. This study of science, in turn, trains the mind into the ways of system and order and this is felt in all transactions into which he enters, resulting invariably in success. Agriculture is the foundation of all industries and animal industry its chief cornerstone.

Ohio Farmer

THE STOCKMAN OF THE FUTURE

ANY boy loves animals and should be taught early in life that they appreciate and respond readily to kind treatment. It is a fortunate thing if the boy who is to be a stockman has a father who is interested in the same business, for he will learn many things worth while from a dad who is successful, things that he would never know otherwise.

It is the hope of the successful stockman that his son will follow in his footsteps. That is, he wants him to begin where he left off. It is unfortunate that this does not occur more frequently in our country. The son that begins with the benefit of his father's experience, with his father's reputation, equipment and customers, has every prospect of success and a great opportunity to do things for the live stock interests of his state and nation.

The father, if the manner of man he should be, will be interested in his son's welfare and will take pains to instruct him. Early in life the boy should be taught to identify the breeds. A little later he should know the better families of the breeds, especially the breed his father produces. He should know something of type, what type or conformation means; be taught the value and proper shape of such points as the twist, loin, crop and heart girth. In this way by the time he is ten years old he will have become a pretty good judge of the kind of animals his father produces.

At an early age the boy should be given an interest in the live stock, no matter how small. When a few years old a penny a head for all animals sold will interest him. Such a share will stimulate his desire to know more about the animals which form the source of his penny supply. He will observe their habits and peculiarities, thus acquiring, unknowingly, a stockman's eye for a good animal. As time goes on and his knowledge broadens the interest must be increased. It is a fine thing to see the son made a full partner. By the time this is possible father wants to place the responsibility elsewhere and then the son should become an equal owner of all live stock.

Unless the father is of more than average intelligence the boy is not likely to learn all he will need to know by experience. It is understood and taken for granted, that the son has secured, in the meantime, a good general education without which he will be woefully handicapped. To go to the top as a stockman he will realize the need of some special training along live stock lines. He begins to read the farm journals, he becomes interested in the teachings of the agricultural colleges and finds there are many things being taught there that he will need to know. If he can go to college and take the course in animal husbandry he will become all the more qualified for success as a stock breeder. Aside from this he will form acquaintances that will be of untold benefit in after years.

Having had years of practical experience with farm animals, having informed himself by reading live stock journals, books and bulletins, and having taken some special work at the college of agriculture the young man is ready to go forth and demonstrate to the world at large that there is both profit and pleasure in the live stock business.

Ohio Farmer

MANAGEMENT OF THE FALL LITTER

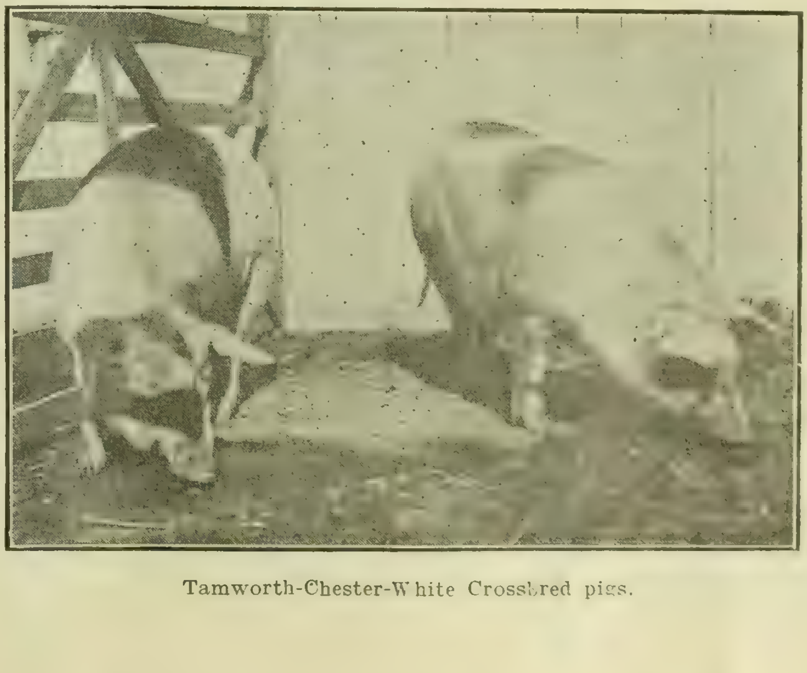
Early Litters Most Profitable. Make Use of Unsaleable By-Products

SPRING and summer litters of pigs are always comparatively easy to handle, and most farmers are able to make substantial profits over and above the cost of feed. Summer fed hogs have advantages such as pasture, a chance for more exercise and warmth, all these contributing towards cheapening the cost of production. The successful marketing of a spring litter however, may be in part or wholly counter-balanced by the improper management of the fall litter. Owing to the extreme winter weather many farmers have decided that there is no money in fattening fall pigs, and were it not for the inability to part with the old time custom and the inherent frugality which prevents the destruction of anything which has value, though possibly unproductive, the fall litter, with many, would be a thing of the past.

In nine cases out of ten it is the man who is successful when adverse conditions prevail, who makes the most profits under favorable conditions. The fall litter seems to be one of the stumbling blocks to a successful issue, and the farmer who has not made a success of fattening pigs during winter will do well to give the matter serious consideration. The winter feeding of pigs is, of necessity, more expensive than summer feeding, and now with increased cost of all feeds, this will be exaggerated still more, and necessitates the most economical use of foodstuff, and the most skilful management if the feeder is to have a margin of profit for himself.

The weaning stage of the pigs' life is the critical period, and where a successful change from mother's milk to hand feeding has not been accomplished, the efficiency of the pork producing machine has been impaired. On many farms the pigs are not ready for weaning until November. This is a mistake. At this date, the fall winds are raw and cold. The youngsters when weaned are deprived of their mother's warmth as well as nature's food. The troughs, feeding utensils, and even the food is likely to be cold. Moreover, on account of the weather it is difficult to get the pigs out for sufficient exercise, which is a vital factor to the young and growing animal. Where such practice prevails, unless special preparation is made accompanied by skilful management, disaster is sure to follow, and by January a pen of unthrifty, crippled, scurfy, coughing pigs, very little larger than when weaned, will be the result.

The value of pigs for converting unsaleable by-products into ready cash has always been held up as an incentive to the rearing of swine. The greater part of these by-products is available during the months of September and October. Odd ears left behind in the corn field, small potatoes, cull apples, pumpkins, broken roots of mangels and even grubs are available at this time. The weather, while cool, is not uncomfortable, the farm is more or less thrown open and the young pigs are allowed to wander at will, picking up a varied and healthful ration with little cost to the farmer, and at the same time getting the needed exercise for developing bone and muscle. A little shorts and skim-milk if available is all that is necessary for their every requirement at this time. Early fall litters, under these conditions, have passed the critical point before the real cold weather sets in. They are partly developed at little



Tamworth-Chester-White Crossbred pigs.

cost, they are better able to stand the close confinement during winter, and respond more readily to the costlier feeds provided during the remainder of the growing and fattening period.

While it is true that litters arriving during the latter part of August and the first of September have much better possibilities than those arriving in October and still later, where it is not possible to avert a late litter it is wise to delay weaning until the pigs are considerably beyond the six weeks stage, at the same time making as much provision as possible for exercise. Brood sows under these conditions require very liberal feeding, especially with a large litter, because the older the litter becomes the greater the drain on the sow. Every endeavor should also be made to encourage the litter to partake of considerable food. A small trough closed from the sow in one corner of the pen answers this purpose. Nothing excels shorts and skim milk for little pigs. An ear of corn or a root occasionally is relished and serves as a change. Pigs fed on the sow in this way until eight to twelve weeks of age make economical gains, and at the older age are better able to shift for themselves when weaned. While it is a heavy strain on the sow, she is usually not bred until well on in the winter and has plenty of time to regain her condition.

Small litters are usually hard to handle under inside winter conditions, and are to be avoided if possible. Where the sow is a good milker they invariable become overfat, and when two to three weeks old begin to scour, move very little from their bed, appear dull and dizzy, and die in a day or two. This disease, which is known as thumps, is hard to treat and prevention is better than cure. Do not overfeed the sow. A sow with four pigs does not require as much feed as one with eight. Do not be misled because the pigs seem to be doing exceptionally well. The biggest and fattest pig is usually the one that goes first. As soon as the litter gives evidence of becoming too fat, force them to take exercise. This may be accomplished by closing the sow out of the pen for a good part of each day, or by giving them a large shed to exercise in. Reduce the quantity of feed as well. Once the pigs are over a month old the greatest danger of this trouble is past.

The farmer who can curtail to a minimum the buying of feed for fattening his pigs is indeed fortunate. Shorts are almost a necessity, especially at weaning time, but where roots, a mixture of farm grown grains and dairy by-products are available the quantity of shorts can be reduced considerably. Shorts is an excellent bone and muscle forming food, and even at present prices should form a part of the ration, especially after weaning. Grains such as barley, oats and corn should be limited in quantity until the pigs attain a weight of one hundred pounds, after which date they may be used almost exclusively, especially with roots, clover or alfalfa and dairy by-products. Pigs relish their feed much better if it is warmed during the winter.

WANTED — PARENTAL SYMPATHY

THERE is no use trying to have the government legislate to keep the young folk on the farm. That depends entirely on the parents. If they try or only half try to show their children the pleasures and profits of farm life, giving them an interest in stock and crops, letting them learn the value of a dollar made in that way by letting them spend it themselves instead of taking it away from them to help buy their boots, many more of the young people would stay on the farm. I had an example last year that illustrates this from another standpoint. I was driving through Stanstead county with one of my agents and stopped at a nice farmhouse, asked where the owner was and was directed to the other side of the hill where we found the farmer at work. We asked him if he did not want a good fence for the road-side Well, yes, he did, but he wouldn't buy this year as he was not sure that the boy was going to stay. I asked the reason and he said, "We had an argument last night and I guess the boy will go. He wanted to take the horse and buggy to go down to the village, and I suppose give his girl a drive, and I would not let him unless he would bring back a sack of salt. That he would not do". I asked him how many of a family, he had. "Oh, only the one," he said, "and he will be 21 next month". We advised him to put himself in the boy's place and think if when he was out with his best girl, he would like the back of the buggy filled with salt, as it would suggest to onlookers the possibility of their being "too fresh". We advised him to try and realize the fact that his "boy" was a man and to treat him as such. As we came back past the house we saw Charlie washing the buggy and we came to the conclusion that Charlie would have the drive minus the salt.—Canadian Farm.

TREES AND LIGHTNING

IS it, as is usually supposed, more dangerous to take refuge under trees in a thunder-storm than to remain in an open field? As a matter of fact, statistics rather favor the tree, and so does what dim reasoning science has so far been able to bring to bear. In Hungary, during 1901 to 1903 of the total number of ascertained deaths by lightning, 15 per cent occurred under trees, and 57 per cent wholly in the open. In the United States in 1900 only 10 per cent of the deaths where the precise conditions were ascertained occurred under trees,as against 52 per cent in the open. If the risk under trees exceeds the risk in the open, at least five or six times as many people must have remained in the open as sought shelter under trees. The deaths in closely built industrial areas, though always less than in rural districts, are considerable, yet we hear very little about them. The tree gets all the notoriety. Certainly, an isolated tree in an exposed position is, on a common-sense view, more likely to be struck than the much less tall human being in a similar position, but even this is assuming for lightning a conformity with regular electrical laws which scientific observation does not profitably support.

Something would appear to depend upon the species of tree. Records taken for a good many years in Lippe give the following order of the liability of different trees to lightning stroke (the figures being corrected on the assumption that the total number of each species of tree in the area was the same) :—Oak 57, fir 30, pine 5, beech 1. Observation in Styria makes oak, poplar, and pear trees the most liable to be struck, and beech, again, exceptionally safe. The apparent differences may be and probably are, to some extent influenced by the height of the tree, its proximity to water, and the nature of the soil. In Germany the liability of different soils to be the recipients of lightning has been put at—chalk 1, clay 7, sand 9, and loam 22.

With regard to the reasoning of science on the question of tree versus open field, most experts refrain from dogmatism. A few main points may be given. To begin with, we need not go beyond the early Victorian text-book conception of electricity as being of two kinds, positive and negative, and of charges of opposite kinds trying to come together. Usually, but not always, the upper atmosphere is positively charged in relation to the lower atmosphere and the earth itself, and consequently there is a neutralizing current from aloft to earth. This current is very slight in any given area of observation because the resistance of dry air is very great. The special conditions necessary to produce a lightning flash are simply the conditions necessary to increase greatly the intensity of the charge, or its "voltage" in some given area aloft.

Two influences will bring this about. First, sunshine increases the positive electricity in the upper air. But the increase is, we may suppose, fairly uniform over an enormous area. Every cloud partakes of it. Then comes the second influence. Each of the tiny drops of water which makes the cloud carries its own little charge of electricity, all charges being of the same intensity or voltage. The intensity depends on the actual amount of the electricity and on the extent of surface to which it adheres. Increase the amount of electricity or decrease the surface and up goes the intensity, pressure, or 'voltage' of the charge, and, consequently, the effort to escape. The cloud becomes a rain cloud by the process of coalescence between the originally tiny drops. But a big drop has less than twice the surface of the two small ones which compose it, so the pressure of the charge goes up.

One of two things may happen first: the cloud may come down as rain, bringing its electricity harmlessly with it; or the electricity may come down violently as a lightning flash, followed by the cloud itself as a thunder shower. A flash happening in this way has been given the title of an "A" flash, or in German "cold" (not causing fire) . Its action can be anticipated very often by a lightning conductor, the conductor showing by a 'brush' discharge of electricity that its point or points are being made a passage for the neutralizing current between cloud and earth; and if the flash does follow, in spite of this relief, it will probably get to earth through the same channel.

A "B" flash, known to German scientists as "kindling" or "causing fire", is much more serious and elusive. A preliminary lightning flash between one cloud and another cloud, which is common, and in itself quite harmless, results in leaving some cloud of the group with a much more intense, unneutralized charge than it had before; and this charge waits for nothing. It goes to earth with such suddenness and violence that it may pass quite near to a well-designed lightning conductor and shatter a brick chimney. It may go straight to earth, while there are trees and people dotted all around. It may avoid striking the flat land even, and go straight to the bottom of a quarry or a sandpit, as happened the other day. It may depart, as photographic observation has shown, from a fairly straight course and dart aside to a falling raindrop, then back to another raindrop, in apparent contradiction of the law that electricity takes the line of least resistance. Similarly, it may leave its easiest course to strike an insulated metal object, apparently in ignorance of the fact that the metal does not present a path to earth.

Sum up the several chances. If you are in the open you may be struck, because you lessen the length of the current's path. If you are under a tree, but not touching the trunk or too near to it, the tree being taller than you, may take what you otherwise would get, and so save you. If you are in a clump of trees, you get, as it were, the protection of all of them, and only the lesser danger of your own particular tree being struck, assuming that there is a danger in being under or close to a struck tree. In this assumption we come to what is perhaps the crux of the question. Some flashes give off dangerous side-strokes. Are such flashes always 'B' flashes? It is considered almost certain that they are, and so one might be under a tree struck by an 'A' flash and take no harm. That brings us to ask: What is the usual proportion of 'A' to 'B' flashes? We do not know. If the 'B' flashes were very rare, we might go under a lonely tree out of the rain and feel fairly safe. If the 'B' flashes preponderate, we may still go into a clump of trees and feel that our chance of harm is no worse than in the open. But to stand close under an isolated tree is, in spite of statistics, more than one has the courage to recommend.

Manchester Guardians

QUEER REPLIES BY FARM STUDENTS

THESE specimens are taken from examination papers at several leading agricultural and dairy institutions of England on authority of Thomas Milburn:

1. "A starter is a large retangular vat with a steam pipe running through it!"
2. "A creamometer is an instrument for obtaining the specific gravity of milk!"
3. "Milk is a kind of semi fluid liquid solid!"
4. "Rennet is a substance obtained from the stomach of a calf and used for colouring butter!"
5. "You ventilate the churn to let out the carbolic acid!"
6. "Bacteria cannot be seen with the naked eye without the aid of a microscope!"
7. "Forty tons is a moderate dressing of lime!"
8. "Another name for bird lime is coblime!"
9. "Lime is obtained in the form of a gas as gas lime, also got as kainit of lime and as sodium carbonate!"
10. "Mechanical analysis means separating the particles of soil by currents of water of different philosity!"
11. "Water is supplied to the plant in the liquid state as rain!"
12. "Animals appear to have an influence on the herbage of pastures—e. g., sheep produce—sheep's fescue; dogs—crested dogstail; and in orchards where fowls run cocksfoot is abundant!"
13. "Speaking of the horse bot fly, a student wrote as follows:—The larvae eat the inner lining of the stomach causing lumps to come on cow's backs!"
14. "Ichneumon flies are insect pharasites!"

SCHOOLBOY "HOWLERS."

SOME schoolboy "howlers" are printed in a recent issue of the "University Correspondent." The following are typical examples of various kinds:

The chief provisions of the Great Charter were Universal Suffering, Votes for Woman, and Abolition of Property.

Finally James II gave birth to a son, and so the people turned him off the throne.

After twice committing suicide, Cowper lived till 1800, when he died a natural death.

The Tropic of Cancer is a painful and incurable disease.

The barons made King John sing Magna Carta.

When Chaucer describes the Prioress as amiable of port he means that she was fond of wine.

When the last French attack at Waterloo proved a failure, Napoleon turned very pale, and rode at full gallop to St. Helena.

Gong is the masculine of belle and vicar of vixen.

The mineral wealth of a country is ginger-beer and lemonade.

Henry IV was the son of John O'Groats.

Quotation from Wordsworth:

" A perfect woman nobly planned
To warm, to comfort, and command."

Julius Caesar was murdered in the Cinema House.

Much butter is imported from Denmark, because Danish cows have greater enterprise and superior technical education to ours.

In the British Empire the sun always sets.

Wolfe declared that he would rather repeat Gray's "Elegy" than take Quebec.

The Three Estates of the Realm are Buckingham Palace, Windsor, and Balmoral.

The courage of the Turks is explained by the fact that a man with more than one wife is more willing to face death than if he had only one.

The Mediterranean and the Red Sea are joined by the Sewage Canal.

Cataract is the name of the mountain on which the Ark rested.

Milton was called the father of English poetry because he was blind and the daughter did the writing for him.

James I claimed the throne of England through his grandmother, as he had no father.

The ground on which James claimed the throne of England were also Scotland and Ireland.

An appendix is a portion of a book which nobody has yet discovered to be any use.

An elephant is a square animal with a tail in front and behind.

The Minister of War is the clergyman who preaches to the soldiers in the barracks.

The Flannnelette peril means petticoat government.

Women's suffrage is the state of suffering in which they were born.

A candidate for the Civil Service must be a neutralized British subject.

The Immortal William is a phrase applied to the German Emperor.

The shape of the earth is an obverse spherometer.

The circulation of the blood was invented by Martin Harvey.

A problem is a figure which you do things with which are absurd, and then you prove it.

Air usually has no weight, but when placed in a barometer a square inch of it is found to weigh about 15 pounds.

Q.: Under what conditions will a body float in water? A.: After it has been in the water three days.

People are vaccinated by being inarticulated with lint.

An octopus is an eight-sided figure.

A synonym is a word you can use when you don't know how to spell the one you first thought of.

Before a man can become a monk he has to have his tonsils cut.

John Bull is the patron saint of England.

Genae puellae formosae sunt.—Beautiful girls are cheeky.

Petit maria.—Little Mary.

Fulminantis magna manus Iovis.—The thundering big hand of Jove.

Il ne faisait rien sans but.—He did nothing without a drink.

A triangle is a square with only three corners.

JUSTICE FOR THE COUNTRY SCHOOL

Education Necessary in all Callings

THERE never was a time when education counted for more than it does to-day, when it was more insisted upon, when it was more essential to success in life. This is not only the case with respect to those vocations which have always been associated with education, their field of activity being almost wholly intellectual, and to which has been given the dignified tile of the learned professions. With respect to these vocations education has always been a primary essential, but to-day the necessity of education has gone beyond that narrow path and it has become so general that there is scarcely a field of activity in which human usefulness is not increased by education, and in most it is a determining factor in the battle for success. The day of rule of thumb has passed for ever, and the present calls for full and exact knowledge, minds taught to think quickly and accurately, and hands trained to execute with skill and thoroughness what the mind dictates. Those qualities are the products of education, and natural endowments, even of so high an order as to amount almost to genius, cannot take their place or supply their deficiency. These conditions surround every occupation lying before the average young man looking out upon the world for the purpose of making a choice of life. This is true of a commercial career in a field which each year is widening, whose problems are becoming more complex and in which competition is ever growing keener. It is true of what may be called mechanical pursuits, the trades and crafts that form the basis of the nation's industries in the ordinary sense of the term. Excessive competition and the stress of other modern conditions make the highest skill essential, not only to the success of the individual, but to the success of the entire enterprise. The mechanic to-day who would stand in the front rank must know more than a trade in the old acceptance of the word. He must know mechanics, the more the better, he must know the reason for things, be able to reason and must possess some originality and power of initiative. In short, he must be educated.

THE FARMER MUST BE EDUCATED

In no occupation does this apply with greater force than with respect to the occupation of the farmer, for the farmer, above all others, must be an all-round man. Agriculture has come to be recognized as a science for whose successful application considerable knowledge is required of several affiliated sciences. Besides being an agriculturalist the farmer must be a business man. He must administer affairs that call for executive ability and sound judgement, and he must keep himself informed respecting what is going on in the world of commerce so as to dispose of his products and make his purchases to the best advantage. He must be educated.

WHO PAYS THE BILLS?

Under our governmental system the matter of education falls within the jurisdiction of the provinces. The common schools and academies, the colleges and universities, are provincial institutions, governed by provincial laws and maintained out of funds raised by the people residing in each province. Some of the school fund comes from the provincial government, and is taken out of the general provincial revenue; in the Western Provinces part is derived from the sale of certain lands set apart for education purposes, and administered by the federal government, but in all the provinces a very large part of the school fund is raised by means of taxes imposed for this purpose upon real estate.

As the farmers are the greatest real estate owners in the country the greater part of these taxes are paid by them, while at the same time they contribute to the general revenue of the province out of which, in most cases, the remainder of the school fund is taken.

COUNTRY PEOPLE AT SOME DISADVANTAGE

From the very nature of things, and therefore, without anyone being blameworthy, the residents of the rural parts and of most villages, must always be at a certain disadvantage with respect to educational opportunities. Universities and colleges, limited in number, must be situated at central points, usually the larger cities of the provinces; collegiate institutes, academies and high schools are situated at local centres such as county towns and principal villages, leaving the common or elementary schools to the smaller villages and the country roads. To a large extent this must always be the case, or be so until it is possible to carry out on a large scale a system of consolidated schools.

Although inevitable, it none the less places country children at a considerable disadvantage as regards the obtaining of an education, for when they have passed through the common school they must leave home if they wish to continue their studies. The higher school may be miles away and while they are attending it their board must be paid in addition to other expenses; whereas town children when they have reached the proper stage of advancement, simply go from one school to another of a higher grade without leaving home or increasing their parents' expenses. This makes it much easier for town children than for country children to obtain the advantages of higher education.

(To be continued)

"MAPLE LEAF"
Stitched Cotton Belting

A BELT that is the most economical, truest running and strongest belt on the market. Being thoroughly waterproof it is particularly well adapted for general farm use such as threshing machines, gasoline engines and other farm machinery. Also suitable for saw mills, flour mills, etc.

ASK FOR "MAPLE LEAF" BELTING
IT IS CHEAPER THAN RUBBER OR LEATHER BELTING.

DOMINION BELTING CO., LIMITED
HAMILTON, ONT.
Montreal Office:—50 Notre Dame Street W.

PORK IS PORK!
Keep your hogs growing by feeding
Pratts, Animal Regulator

It has saved as much as thirty days' time in fattening and enables the owner to get more than the market price for his hogs. Your hogs will relish their feed and grow fat quickly if you use Pratts.

"Your money back if not satisfied"

25-lb. pail, $3.50 also in packages at 50c. and $1.00 at your dealer's.

PRATTS Worm Powder, being purely vegetable, has a strong tonic effect. Its effects are quick, sure and lasting. Sold in 50c. boxes.
Send us this ad., together with 10c., for Pratts "Pointers on Cows, Hogs and Sheep," 172 pages—or "Pratts Pointers on Horses," 183 pages. Both books for 20c.
S-13
PRATT FOOD COMPANY OF CANADA, Limited · Dept. 8 TORONTO

TRAPPERS WE BUY FOR CASH
And pay highest prices for Fine Fox, Mink, Martens, Rat, Lynx, Wolves and all other Furs, Hides and Ginseng. Best facilities in America. Send for Free Price List and Shipping Tags. No commission charged.
ROGERS FUR COMPANY,
Dept. 282 St. Louis, Mo.

"Plymouth Rock Cockerels for Sale"

ABOUT fifteen Barred Plymouth Rock cockerels, very fine stock from imported strain, $1.50 each. Hatched early in spring and very vigilant. Apply to J. P. GAUTHIER, New Richmond Station, P. Q.

FOR SALE—Pure-bred and choice poultry; all breeds and varieties. Price, from one to ten dollars. Specialties: White Rhode Island and Pekin and Alesbury ducks. J O. MARCHAND, St. Barthelemi, Que.

FOR SALE — A registered englishbred stallion; weight 1300 lbs., red hair, very good breeder; fast trotter and good worker, very gentle and quite, good bargain for a month. ELEUSIPPE COUTURE, St. Augustine, Portneuf cty, Que.

TRAPPERS.
Get More Money For Your Furs
Don't ship anyone furs till you get *Our Free Bulletin* quoting cash prices we actually pay for *Mink, Skunk, Fox, Wolf* and all other furs. We charge no commissions. Write today for Free Bulletin—it will pay you big.
NATIONAL FUR AND WOOL CO.,
Dept. 293 St. Louis, Mo.

Big Ben

Every farmer should hire him

You pay him only $3.00 for 365 full 24-hour days a year—and nobody knows how many years he'll last, for he has never been known to wear out.

His board amounts to a drop of oil every twelve months—that's all the pay he asks.

His work is getting the farm hands in the fields on time, starting the before-breakfast chores on time, and telling the right time all day so the women folks can have the meals on time—these are easy jobs for him.

Big Ben stands seven inches tall. He is triple-nickel plated and wears an inner vest of steel that insures him for life. His big bold figures and hands are easy to read in the dim morning light. His keys almost wind themselves. He rings for five minutes straight, or every other half minute for ten minutes as you prefer.

The next time you're in town just drop in at your dealer's and ask to see Big Ben. If your dealer hasn't him, send a money order for $3.00 to *Westclox, La Salle, Illinois*, and he'll come to you, transportation charges prepaid, all ready for work. Hire Big Ben for your farm and he'll prove the promptest hired man on the place.

FREE Premiun of Le Canada

For Men

STRAIGHT PIPE (Briar and Amber).
CROOKED PIPE (Briar and Amber).
AUTOMATIC STITCHER (always ready).

For Women

ROCK CRYSTAL, beads with golden setting.
PRAYERS BOOK, with shagreen cover and gilt-edged.
KITCHEN SETS (Hachets, knives, forks, etc).

Conditions: One year subscription to

"LE CANADA" WEEKLY

73 ST. JAMES STREET

Circulation Dept. MONTREAL

The JOURNAL of AGRICULTURE

AND HORTICULTURE

Volume 18 December 1st 1914 Number 6

KING OF THE YARD AND PRIDE OF THE TABLE

WITH CHRISTMAS GREETINGS TO OUR READERS.

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

SYDNEY BASIC SLAG

Every Quebec farmer knows the value of Basic Slag (Thomas Phosphate) but when he buys these goods he should

MAKE CERTAIN HE IS SUPPLIED WITH THE BASIC SLAG MANUFACTURED IN SYDNEY, NOVA SCOTIA.

Formerly all Basic Slag was imported from abroad but now these goods are manufactured in Canada by Canadians for Canadian farmers and it is unnecessary to buy Basic Slag imported from abroad. In the awful conflict which is raging in Europe the trade of the entire world is disturbed and Canadian industries have suffered seriously. It is our duty therefore to help our own kith and kin by purchasing Canadian made goods wherever possible. The Basic Slag manufactured in Sydney, Nova Scotia, is as good and as cheap as the foreign article and should be bought in preference. The Canadian farmer is asked to remember that

EVERY TON OF BASIC SLAG IMPORTED FROM ABROAD MEANS A LOSS OF $3.00 IN WAGES TO CANADIAN WORKMEN

Be a patriot, keep this work at home and help your fellow countrymen by BUYING ONLY THE BASIC SLAG MANUFACTURED IN SYDNEY, NOVA SCOTIA.

Applications for agencies in unrepresented districts should be addressed to:

THE CROSS FERTILIZER CO., Limited
CASIER POSTAL STATION "B",
QUEBEC.

Or supplies can be obtained from our local agents:

P. T. LEGARE Limited. QUEBEC.

DEAF

People—thousands who believed themselves completely deaf—are hearing again, clearly and perfectly, with the aid of a remarkable, new scientific invention. Will you try the—

Hearing in the Palm of your hand.

New 8-Tone Mears

Ear Phone

at our risk? It is an ingenious inconspicuous little device which has improved the Hearing of thousands of sufferers from deafness. It embodies eight different adjustments, any of which can be changed with one touch of the finger to suit any condition of the hearing.

Free Trial Prove its powers at our risk. Will you try a Mears Ear Phone for 15 days in your home, absolutely free? Will you believe the evidence of your own ears? That is all we ask. **Send for our free trial offer.**

Special Direct Offer

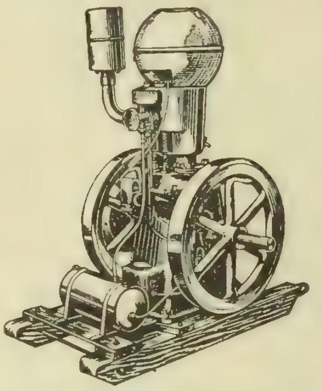
The new 8-Tone Ear Phone can be had only direct from our Montreal Offices. To advertise our new direct-selling plan and to introduce the Perfected Mears 8-Tone instrument, we are now making a Special Introductory Offer direct to you. Write at once for particulars.

Valuable Book on DEAFNESS FREE!

Write for valuable book on deafness—mailed free—explains all the causes of deafness; tells how to stop the progress of the malady and how to treat it. Write at once—now—for this FREE Book and our Special Introductory Offer. Send to-day—now. 1

Dupuis Frères
Limitée
Dept 103 MONTREAL, CANADA

LISTER
GASOLINE ENGINES



The Best and Simplest Motive Power for Farm Use

Every size fitted with Bosch High Tension Magneto Ignition and Automatic Lubrication.

MANY IMPORTANT ADVANTAGES OVER THE HORIZONTAL TYPE

Write for complete catalogue H

R. A. LISTER & Co., Limited,
58-60 Stewart St., TORONTO,
ST. JOHN, N. B., WINNIPEG, Man.

Sole distributors in Canada for

The Melotte Cream Separator, Lister-Bruston Electric Lighting Plant.

(Separate Catalogues on application)

A FINE Durham bull, red hair, born in April last, registered and inoculated. Apply to OCTAVE AFLAMME, St. Agathe de Lotbinière, P. Q.

KODAK

Of all the gifts at Christmas

none is appreciated more than a Kodak or Brownie Camera.

The pleasure of taking pictures—the delight in developing and printing them yourself, at home—the joy in showing them to your friends, is slight in comparison to the comfort they are in recalling pleasant incidents that have passed.

KODAKS, $7.00 and up.
BROWNIE CAMERAS, $1.00 to $12.00.

Catalogue free at your dealer's, or by mail.

CANADIAN KODAK CO. Limited
604 King Street, West, - - - - TORONTO.

—Insure Your Horses—

against Death through Disease or Accident, Fire and Lightning. We issue the most liberal policies free from vexatious conditions and offer indisputable guarantee of solvency and square dealing.

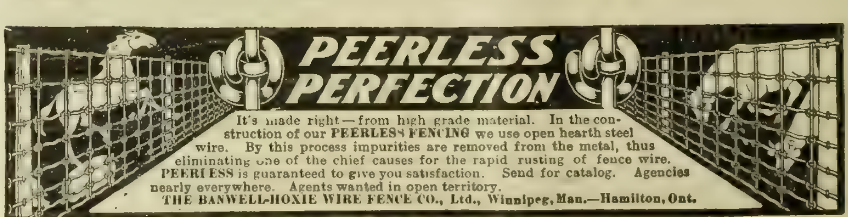
We insure: Stallions, Track Horses, Draft Horses, In-Foal Mares, with or without insurance on the Foal; Cattle, Castration and Transit Risks, etc.

All kinds of Animals Insurance

Write us for further information and address of nearest agent.

THE GENERAL
ANIMALS INSURANCE COMPANY OF CANADA

New address:—
ROOM 721, POWER BUILDING. 83 CRAIG ST. WEST, MONTREAL.



It's made right—from high grade material. In the construction of our PEERLESS FENCING we use open hearth steel wire. By this process impurities are removed from the metal, thus eliminating one of the chief causes for the rapid rusting of fence wire. PEERLESS is guaranteed to give you satisfaction. Send for catalog. Agencies nearly everywhere. Agents wanted in open territory.

THE BANWELL-HOXIE WIRE FENCE CO., Ltd., Winnipeg, Man.—Hamilton, Ont.

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 101,560
FRENCH, 92,010
ENGLISH, 9,525

Volume 18 DECEMBER 1st 1914 Number 6

EDITORIAL

THE VISION

MAY I tell you in a simple parable what I think this war is doing for us? I know a valley in North Wales, between the mountains and the sea. It is a beautiful valley, snug, comfortable, sheltered by the moutains from all the bitter blasts. But it is very enervating, and I remember how the boys were in the habit of climbing the hill above the village to have a glimpse of the great mountains in the distance, and to be stimulated and freshened by the breezes which came from the hilltops, and by the great spectacle of their grandeur. We have been living in a sheltered valley for generations. We have been too comfortable and too indulgent, many, perhaps, too selfish, and the stern hand of fate has scourged us to an elevation where we can see the great everlasting things that matter for a nation—the great peaks we had forgotten, of Honour, Duty, Patriotism, and, clad in glittering white, the great pinnacle of Sacrifice pointing like a rugged finger to Heaven. We shall descend into the valleys again; but as long as the men and women of this generation last, they will carry in their hearts the image of those great mountains peaks whose foundations are not shaken, though Europe rock and sway in the convulsions of a great war. —*Lloyd-George in his speech at the Queen's Hall, London, Sept. 19th* 1914.

FOOT AND MOUTH DISEASE

AS the result of the widespread epidemic of foot and mouth disease the exportation of cattle and sheep to the United States and to the United Kingdom, and the importation of these classes of stock from the United States into Canada have been prohibited by the various Governments involved. So far as we are aware no cases of the disease have yet been reported in Canada, but it is important that our stockmen should be on the lookout for it and take prompt action when they have reason to suspect its presence in their herds. Failure to check the disease at its first appearance may result in our suffering enormous losses such as our neighbours in the South are now experiencing. Every stockman should acquaint himself with the symptoms and notify a veterinary inspector as soon as he notes these signs of the dread disease. At our request Dr. Savage, Veterinarian of Macdonald College, has prepared an article about this malady which will be found in our Live Stock Department.

The embargoes upon exportation and importation will, of course, interfere materially with trade in live stock. Fortunately, however, Canada is at present understocked and the development of our domestic trade will not be affected unless laxness on the part of someone should result in the spread of the malady into our territory.

If prices are lowered young breeders should take advantage of the opportunity to strengthen their herds and flocks by the purchase of high class animals of pure breeding. With good judgement they may secure better individuals from their neighbours than many of those which in happier circumstances are brought over the ocean or over the boundary line.

RENTED FARMS

IN every section of the province will be found tenants on rented farms, and in some sections they are increasing in number year by year. It is not our purpose to enquire into the causes of this increase of rented farms but to throw out a warning of a grave danger which will injure the agricultural industry if proper measures are not taken at once to safeguard the fertility of the farms.

In European countries rented farms are common, but the agreement between the owners and tenants is of such a nature that the fertility of the land is maintained. In this country, however, where land is plentiful this matter of keeping up the richness of the soil is too frequently ignored in the renting of farms. But long after the owner and the tenant have turned to dust this land must feed the people, consequently the use or abuse of the land by the owner or tenant as they may see fit concerns the country as a whole, and some safeguard should be inserted in every lease.

Many leases are taken out for short terms—one or two years, and in such cases the land is likely to suffer, for the tenant will naturally take all he can out of the land without going to the expense of feeding it. We have known cases where the landlord and tenant actually conspired to impoverish the soil by sharing the crop grown to grain exclusively.

Under no condition should a lease be given which does not insure the feeding of the land and the maintenance of the fertility of the soil. Long leases as a rule are preferable to short ones for the reason that it is to the best interests of the tenant to keep up the fertility—for some years at any rate.

This matter of renting land should be taken in hand by the Conservation Commission of Canada, for it is one which has to do with the welfare of the country, both present and future.

THIS CHRISTMAS SEASON

AS the Christmas season draws near millions of men in Europe are grappling in a terrible death struggle, tens of thousands of homes are laid waste, and countless homes are mourning the loss of loved ones. Strife, gloom and hatred instead of peace, gladness and good-will fill the hearts of great Christian nations. Like a sudden thunderstorm in midsummer the devastating war came to cast dreadful havoc among peaceful peoples. Little did we dream last Christmas that such a calamity would befall the world before another year had passed. The merry merry bells of last year's Yule will ring out sorrow and grief this Yule throughout the warring nations. Many of us were optimistic enough to believe that the spirit of good-will was so strongly implanted in the hearts of all classes of every nation that permanent peace would reign and that war was a monstrous thing of the past. But we were mistaken. We still believe, however, that the spirit that pervades the Christmas season is not dead in spite of war's loud tumult and devastation. The ready response to the cry of the suffering Belgians, and the self-sacrificing help of the Red Cross army of men and women to both sides in the struggle are some of the evidences that the brotherhood of man is still strong.

The misery caused by the war will appeal this Christmas season strongly to all of us, and our gifts will be bestowed liberally on those who are not so fortunate as we are. May we not hope that the coming Christmas will—

"Ring in the love of truth and right,
Ring in the common love of good.

....

Ring out the thousand wars of old,
Ring in the thousand years of peace.
Ring out the darkness of the land,
Ring in the Christ that is to be."

INVESTING FARM PROFITS

GOVERNMENT reports tell us that the farmers of Quebec have a large amount of money, representing farm profits, deposited in banks or invested in stocks and bonds. This surplus money is drawing but small interest in most cases, and none at all in some instances.

The great objection to this form of investment is that the money is used for the upbuilding and maintenance of interests not concerned with farming. The proper place for such surplus money is the farm, where it will yield bigger dividends than any bank or stock company is prepared to give. What better paying investment for a farmer than to put this surplus money in drain-tiled land, or better buildings, or better sires for his herds? The successful farmers of to-day are those who made loans to their farms. Many men have not the faith in their farms to entrust them with loans, and frequently when loans are made they are too meagre to produce the best dividends from the farm.

Visitors from other countries observe this withholding by Canadian farmers of loans to the farm, and comment freely upon the folly of such a practice. In a new country like ours when so many improvements remain to be done to bring

CONTENTS

EDITORIAL.—The Vision; Foot and Mouth Disease; Rented Farms; This Christmas Season; Investing Farm Profits; Soil Fertility; Professor Klinck's Successor in Macdonald College; Two types of Farmers; Commodity Prices are easier; A Report of the Commission on Technical Education, Part II; Teaching of Agriculture in Ontario Schools; Short Courses in Agriculture and Farm Home.

ORCHARD AND GARDEN.—Sugar Makers' Meeting; The Planting and care of Shade Trees; Care required in storing Potatoes. "Maple" to mean "Pure Maple"; Ontario Vegetable Growers' Convention; Seed growing from Vegetables; Annual Meeting of the Ontario Entomological Society; Progress in Fruit growing in Quebec.

FARM AND FARM CROPS.—Distribution of Seed Grain and Potatoes; The Production of registered Seed in Canada; Pumping from River to Stable; Stable Pump for distant Well; Soil Management in relation to yield and quality in Seed; Concrete Fence Posts.

LIVE STOCK.—Cotton Seed Meal; The Market Lamb; Foot and Mouth Disease; The Care of the Colt; Winter Dairying; Official Records of Holstein Freisian Cows; Ayrshire Record of Performance test.

DAIRY.—Dairy School, St. Hyacinthe; Report of the Dairy Commissioner; How Feeds affect the keeping quality of Milk; Butter making and its development in Eastern Ontario.

POULTRY.—Capon production; Noodled geese; The Outlook; Fattening Ducks; Dressing Ducks and Geese.

WOMAN'S WORLD.—A Mother's duty to her Child; Foods and Food Preparation; The Children's Homer.

GENERAL INTEREST. — Two Christmas Poems; Justice for the Country School; Santa Claus and Little Billee; Mistress Mary Shakespeare and her famous Son; part II; Protect the Manure; Factories and Armaments; Agricultural Co-operation in Wisconsin.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

the farms into first class condition it is very evident that the criticism is well taken.

The stability of farming is established. No other business is able to withstand a crisis like the present one so well, consequently there should be little hesitation in investing the surplus cash in the farm, especially when heavy dividends are in sight.

SOIL FERTILITY

ONE of the most perplexing problems of modern agriculture is the determination of the factors of soil fertility. At one time it was believed that fertility, measured by plant growth, depended mainly on the supply of plant food or manures available to the plants. Recently, however, it has been shown that plant growth depends on several factors, such as the amount of plant food in the soil, the amount of water present, the air supply, the temperature, the root space, and the presence or absence of injurious agents in the soil. It is now recognised that manure is not plant food until it has undergone a manufacturing process in the soil. This process, however, may be hindered or hastened according to the conditions existing in the soil. In some soils, too, considerable waste occurs during the process which it is the duty of the farmer to prevent. For example, on the application of some nitrogenous fertilizers it has been shown that the crop used up only a part, the rest was lost. In this case a better balancing of the fertilizers would have decreased the loss, while the nature of the soil was also a factor.

Farmers are beginning to realise the value of adding lime to some fields to improve the texture of the soil. But the lime may be beneficial for other reasons, as has been shown at the Rothamsted Experimental Station in England where much valuable work is being done in studying soil and plant nutrition problems. It has been known for some time that the agents of the manufacturing process in the soil are bacteria. But the bacteria are not the only active organisms in the soil; other and larger organisms are present which keep their numbers down. A treatment that kills these larger organisms allows the bacteria to multiply and produce abundant plant food. Now quicklime has this power, hence its value in many cases of increasing soil fertility.

Another interesting fact brought out at Rothamsted and elsewhere is that in most cases there is less accumulation of nitrate (plant food) on cropped than on fallow fields, even after allowing for the nitrate taken up by the plant. The growing crop interferes in some way with the manufacturing process by the bacteria. Some investigators account for this interference by supposing that roots of growing plants produce poisonous substances, but the Rothamsted investigators are opposed to this theory. The harmful effect of some growing crops on others and on succeeding crops is not yet explained, but in all probability this problem is related to the one mentioned above.

In addition, there is much to be found out regarding the effect of the various types of cultivation on soil fertility. This is an intricate problem, but a solution would undoubtedly be of great value.

We have touched on but a few of the problems relating to soil fertility, which investigators are trying to solve. To say that agriculture is an easy science is as far from the truth as can be; in fact it has to do with most intricate problems which in spite of all the progress in science in late years have not yet been solved.

PROF. KLINCK'S SUCCESSOR IN MACDONALD COLLEGE

THE Chair of Cereal Husbandry in Macdonald College has been filled by the appointment of James Murray, B.S.A. Professor Murray, is a native of Simcoe County, Ontario. He was educated for the teaching profession and aftewards in the Ontario Agricultural College. He graduated in 1902 and immediately thereafter was appointed head of the Seed Laboratory in the Seed Commissioner's Division at Ottawa. In 1904 he was sent by the Seed Commissioner to take charge of the work of the Seed Division in the four western provinces. After two years he resigned to enter the service of the Saskatchewan Department of Agriculture as Superintendent of Fairs and Institutes. From 1906 to 1911 he was Superintendent of the Dominion Experimental Farm at Brandon, which position he resigned to take charge of a 64,000 acre tract of land at Suffield, Alberta, for the Canadian Wheat Lands, Limited, an English company.

In all of these positions Mr. Murray has exhibited exceptional energy and initiative. It was his seed-testing work at Ottawa, the first undertaken in Canada, that furnished the basis for the Seed Control Act. As representative of the Seed Division in the west, he organized seed fairs, schools of instruction in grain judging, smut control and weed eradication and standing crop competitions. During his connection with the Saskatchewan Department and with the Dominion Experimental Farms he conducted or assisted in winter courses for farmers' sons. In the large scale farming project of the English company he brought under cultivation within three years 25,000 acres of land. This "bonanza" farm is eventually to be irrigated but up to the present it has been necessary to operate it upon the dry-farming basis and it has taxed the ingenuity of the manager to get any sort of returns with an average annual precipitation of only ten inches. In alfalfa seed growing Mr. Murray believes he has found a line of farming suitable to a district of this arid character.

It will readily be gathered from the above that Mr. Murray's experience has been an exceptionally broad and varied one and that Macdonald College is gaining in him a man capable of great service.

TWO TYPES OF FARMERS

IN every community there are two types of farmers—those farming for what they can get out of it *now*, and those farming for the future. The first type of farmer is all too common, and is a curse rather than a blessing to his community. He grows crops by impoverishing the fertility of the soil, and sooner or later he is forced either to give up his farm or to make a poor living on an exhausted soil. Usually he takes but little interest in matters which have to do with the betterment of the community, such as better roads and better schools, for these to him spell considerable expenditure of money. He makes but few permanent improvements on his farm, such as underdrainage and buildings, for these also mean an outlay of precious money.

The second type of farmer has a vision of a future for his farm and community, with improved conditions which he helped to bring about. He considers his farm a heritage which must be carefully conserved for posterity. He restores to the soil the fertility removed by the crops he grows, and makes such permanent improvements as future requirements demand. He sees the future value of pure-bred sires in the upbuilding of his herds, and in the planting of orchard and shade trees he sees rich returns and added beauty in days to come. He takes a civic interest in the construction of good roads and schools for the sake of their future as well as their present value.

For lack of vision the people perish. Happy is the community whose farmers have visions of a better future which may be brought about by their united efforts.

COMMODITY PRICES ARE EASIER

THE Labour Department's index number reviewing prices in October shows a tendency to a lower level. When the war broke out the number rose almost at once from 135.5 to 140.7. It has now eased back to 139.0, or nearly two points. Compared with a year ago, however, it is nearly five points higher. The October relapse is chiefly accounted for by declines under the headings,—grains and fodders, animals and meats, and fruits and vegetables. Among miscellaneous foods, cream of tartar and glucose fell, but sugar, molasses and honey advanced. Silk and jute lowered the average for textiles. Metals, coke, linseed oil, hops and rubber also developed weakness. On the other hand, New Brunswick spruce deals, glass, starch and newsprint were higher.

The above refers to wholesale prices, of which 272 are included in the review. Retail prices in the several Canadian cities followed pretty generally in the wake of wholesale. From the householder's standpoint the further advance of nearly one cent per lb. in sugar was the most unfavourable incident of the month. On the other hand, potatoes were unusually low in Eastern Canada, and meats went down in several places. Bread went up in four cities. Flour went up in three and down in three. Butter was unusually steady, though it usually advances at this time of the year; the rise in September perhaps accounts for this. Milk came down in two places, which is unusual at this time of year. Rents have been falling pretty generally for some months past.

REPORT OF THE COMMISSION ON TECHNICAL EDUCATION

II. The Rural Schools of Denmark (B). The People's High Schools

THE Rural High Schools of Denmark constitute a special class of the private schools. They are boarding schools, and give instruction to young men and women who have already passed through the public schools. These High Schools are of two types—those which give instruction in popular and higher branches of learning are called the People's High Schools; those which give instruction in special practical branches are called Agricultural, Horticultural, or Husmand schools. State grants are made to these schools as well as to needy pupils. After leaving the elementary school at fourteen years of age, the boys return to their homes for a few years, then, after 18, they go for one or two winters to the People's High Schools to continue their education. They then return to farming, or first take a course at an Agricultural School.

The People's High Schools, are Denmark's original contribution to organization method and practice in education. In the large the movement was planned, and the schools are still conducted, for the purpose of (1) developing a quick sense of responsibility for life, (2) fostering a love of and devotion to Denmark and (3) cultivating moral, intellectual and practical qualities which enable and move the individual students to do more work for Denmark and to obtain greater satisfaction in life for themselves.

Young men who attend in winter and young women in summer are admitted not before 18 years of age and seldom after 25. Grundtvig (who conceived the plan) held to the opinion that it is at the age of 18 to 25 that the intellectual faculties are most accessible to intellectual influence.

At the present time there are about 50 People's High School proper which give a liberal education; about 30 People's High Schools with a vocational (that is, agricultural, housekeeping or technical) side; about 20 Agricultural Schools and about 13 Housekeeping schools.

In Denmark it is generally held desirable that young grown-up people, who are to be occupied in agriculture or housekeeping should begin their later education with a High School course before attending one of the vocational schools. It is estimated that about half the students at the Agricultural Schools have first been students at the People's High Schools. On the whole the feeling seems to be rather general against putting "practical", "much scientific" or "agricultural" instruction into those People's High Schools which are not distinctly vocational.

The education imparted to the rural population by the People's High School is an essential reason why Denmark has risen from being one of the poorest of European countries to be one of the richest. Perhaps nowhere else does one find the people in general so well educated. With education, as with wealth, there is a general diffusion which brings the average to a high level without leaving large numbers unhelped. The nation through the personality of its people gives one the impression that it hungers and thirsts after intelligence. Out of such conditions and material the educational and co-operative movements have grown.

At the People's High School the course for men occupies only five or six months of one winter, and the course for young women only three months of one summer. The courses at the Agricultural Schools occupy about the same time. Allowing for those who attend an Agricultural School after attending a People's High School and those who attend twice, about one person in every five who annually come to the age of 18 years in the rural population attends a People's High School (liberal, agricultural or housekeeping) . The proportion has been steadily increasing. After the young people go through the comparatively short course, as a rule they return to their homes and to farming work. It is estimated that there are at the present time in Denmark nearly 150,000 men and women who have attended these High Schools. Mr. Thornton says that when Parliament assembled in 1901 it was found that 30 per cent of the members of the Upper and Lower Houses had been High School pupils.

The High School pupils exert a marked influence on the social and intellectual life of the people by the spirit of comradeship and friendship which is maintained after their attendance at the High School ceases. Scattered throughout Denmark in 30 or 40 different towns, "High School Homes" have been established and maintained. These are in the nature of simple hotels, with plain living accommodation, a few rooms for meetings, useful libraries etc. When ex-students of High Schools have occasion to visit the towns they make these High School Homes their headquarters.

The work at the school is characterised chiefly by attention given (1) to history, the mother tongue, and literature. (2) to physical culture and singing, and (3) to other subjects including some science and practical work.

The teachers claim that the importance and emphasis should be laid upon *how* information is imparted and education given, and upon *who* it is that gives it rather than upon *what* is the subject matter.

It is not likely that these High Schools could have succeeded but for their inexpensive character. They are organised, appointed and equipped in the very simplest way. They are residential schools where the pupils all live together. Each student brings to the school the bedding required and some other small articles necessary. The total fees will average about 30 Kroner (about $8) per month, including board and residence. The total outlay of the student, including expenses of travel, books, etc., would be between $50 and $65 for the five months course. The fees vary somewhat and are slightly higher (47 to 27 Kroner per month) at some Agricultural Schools.

S. B. S.

THE TEACHING OF AGRICULTURE IN ONTARIO SCHOOLS

SINCE 1903 the work of Agricultural teaching in Ontario schools has rapidly increased both in volume and in importance. Steps have been taken to provide grants both to teachers and trustees for carrying on work in connection with school gardens, and teachers are now being trained by means of summer classes at Guelph to take Agricultural classes in their schools. This new departure promises to be very profitable for all concerned—for the teachers, for the pupils, for the trustees, for the province, and for the Dominion as a whole.

Ontario is setting an excellent example to the other provinces in this matter and the work is now so extensive that the Education Department appointed a Director of Agricultural Education, whose energies are fully employed. The following table gives some idea of the increase in the number of schools and in the grants paid.

Year	No. of Schools	Grants to Trustees	Grants to Teachers
1903	4	$400.00	....
1904	8	450.00	....
1905	5	140.00	....
1906	8	290.00	....
1907	2	40.00	....
1908	14	680.00	$120.00
1909	16	560.00	150.00
1910	17	750.00	510.00
1911	33	1310.00	900.00
1912	101	1893.03	2203.00
1913	159	2889.27	3131.00
1914	278	....	....

Thus, though attempts have been made in past years to teach unnaturally from books, nature study and school gardening have pointed the way to a better and more natural method through school gardens, school fairs, seed testing and other practical devices. In 1903 School Boards were offered an initial grant of $100 for starting a school garden and $10 a year thereafter. The table shows that this encouragement stimulated very little local effort and that the work was in a moribund condition in 1907. In that year, however, the annual grant was increased to $20 and in 1908 a grant of $30 was paid to each teacher who had taken special courses at the Ontario Agricultural College in Guelph. In 1910 the initial grant to the trustees was decreased to $50 but the grant for annual upkeep was increased to $30 if a school garden was maintained and a course in Elementary Agriculture and Horticulture taught in connection with it. Teachers who took special summer work and had an agricultural diploma for such summer courses were in 1910 also paid $30 annually as a grant. Since that encouragement to both trustees and teachers more interest has been taken in the work and the schools participating in grants have increased from 17 in 1910 to 278 in 1914. This phenomenal increase has been stimulated by other inducements. In 1912 *home gardening* was accepted instead of *school gardening* if it was used as a practical basis for the school instruction in agriculture. The school garden now becomes secondary and the teaching of agriculture takes first place. The garden, whether at school or at home, is used now merely to illustrate the teaching in school. In 1914 no fewer than 56 schools are conducting the work through home gardens.

What is even more creditable is that the secondary schools are now taking up this work seriously and of these there are now five secondary schools with trained teachers actually teaching agriculture. This list includes one Collegiate Institute, three high schools and one Continuation School.

The Department of Education has encouraged the work by paying grants where it is being carried out and—most important of all—by training teachers to take it.

THE GARDEN AND ORCHARD

SUGAR MAKERS' MEETING

THE Annual Meeting of the Pure Maple Sugar and Syrup Co-operative Agricultural Association will be held in Beauceville in the second week of January. Announcement of the exact date will be made later.

THE PLANTING AND CARE OF SHADE TREES

A bulletin entitled "The Planting and Care of Shade Trees" has just been issued by the Central Experimental Farm.

This publication, which has been prepared by Mr. F. E. Buck, B. S. A., Assistant to the Dominion Horticulturist, contains practical directions and advice in the selection of shade trees, their planting, transplanting and subsequent treatment and care, with notes on the principal injuries and unfavourable conditions to which shade trees are subjected, especially in towns and cities. Lists of varieties suitable for street and home planting are also given.

This bulletin is No. 19 of the Second Series of the Central Experimental Farm, a copy of which will be mailed to those to whom the information is likely to be useful and who make application to the Publications Branch, Department of Agriculture, Ottawa.

CARE REQUIRED IN STORING POTATOES

POTATOES should be thoroughly dry and should be stored in a cool, well-ventilated cellar or storeroom which is perfectly dark. Do not pile the potatoes in heaps on the floor or against the wall; slats should be nailed about one inch apart and four inches from the wall; a temporary floor should be laid about four inches above the permanent floor, with openings between the boards. This will allow the air to circulate though the pile. Large piles should have ventilators running through them. These should be made of wood, with slats on two sides for openings.

The temperature of the cellar or storehouse should be kept as nearly as possible at from 33 to 35 degrees. The cooler potatoes are kept without freezing, the better. If too warm, their value for seed is lessened, as they sprout too early.—*J. F. in Conservation.*

"MAPLE" TO MEAN PURE MAPLE

ON October 20th the Department of Inland Revenue issued a circular to dealers in maple products advising them that the amendment to the Adulteration Act referring to such products comes into effect on January 1st 1915. This amendment, adopted last Spring, prohibits the use of the word "maple" on any but genuine maple syrup and sugar. The circular, copies of which may be obtained from the Minister of Inland Revenue, gives the exact wording of the law and also the standards at present used in determining whether a syrup is to be regarded as pure or adulterated and the penalties to which adulterators are subject under the Adulteration Act. For adulteration such as is not injurious to health, the penalty for a first offence may run up to two hundred dollars and costs, or to three months' imprisonment. For a second offence of the same sort it may be as much as five hundred dollars and costs and six months' imprisonment. If the adulteration is of such a character as is deemed injurious to health still heavier penalties may be inflicted.

It is to be hoped that little, if any, occasion will arise for the imposing of these penalties, and that the quality of the maple syrup and sugar on the market from this time forward may be such as to command general confidence on the part of the consuming public.

ONTARIO VEGETABLE GROWERS' ASSOCIATION CONVENTION

THIS convention was held in the Railway Committee Rooms, Parliament Buildings, Toronto, Ont., on Tuesday, Nov. 10th. 1914. After the President's address and the report of the Secretary Treasurer, the first item was a paper by S. C. Johnston, B. S. A., vegetable expert of the Department of Agriculture, on the experiments conducted for the control of celery blight. In his report Mr. Johnston brought out the fact that from 75% to 95% of all the celery sprayed was free of blight, the lower percentage being where the work was done with knapsack sprayers, rather than with power outfits. Even on the rows which were next the check rows, no blight appeared, showing that the Bordeaux mixture had kept it from spreading. The plants were sprayed twice in the seeding bed and every week to ten days in the field, the last application being made just before it was put into storage. On a number of fields where there had been a very heavy attack of blight last year, this year through the use of Bordeaux the plants were kept clean. The Bordeaux was made up on the 4.4.40 formula.

Mr. Delworth gave a very good description of his trip to the American Vegetable Growers' Convention at Philadelphia. He spoke of the fine exhibits put up by various manufacturers, and of the educational exhibits by a number of the Agricultural Colleges, but dealt more especially with the trips through the growing districts around Philadelphia.

Mr. F. C. Hart spoke on co-operative buying and selling. He dealt with his subject largely from

---

Summer courses are held at the Ontario Agricultural College where diplomas are granted for efficient work. But a new type of High School Specialist is being trained for Secondary Schools. The Degree of B. Sc. (Agr.) is now conferred on students who take a two years' course at either Queen's or Toronto or McMaster University and a further two years at the Ontario Agricultural College. On the top of this there comes a fifth year of professional training at the Faculty of Education at Toronto or Queen's University to inculcate proper methods of teaching. This wholly new type of degree is a paralled to practical science and mining degrees and a graduate who receives his B. Sc. (Agr.) will be recognised in a school as a Science Specialist as well as an Agricultural Specialist. The most important feature of the situation is the enhanced prestige that now surrounds the subject of agriculture in the schools of our neighbouring province. We need graduates of such a type in Quebec and we ought to have them. When will they be forthcoming?

SINCLAIR LAIRD,

Macdonald College

FREE SHORT COURSES IN AGRICULTURE AND FARM HOME

MACDONALD COLLEGE offers the following short courses in 1915:—

1. Lectures on Live Stock, Field Crops, Horticulture, Poultry and Farm Home:—

		1915	
At Magog, Que.,	At Knowlton, Que.,	January	4th.
Ayer's Cliff, Que.,	West Shefford, Que.,	"	5th.
Coaticook, Que.,	Bedford, Que.,	"	6th.
Marbleton, Que.,	Waterville, Que.,	"	7th.
Sawyerville, Que.,	Lennoxville, Que.,	"	8th.
Scotstown, Que.,	.. ..	"	9th.
Hemmingford, Que.,	.. ..	"	11th.
Athelstan, Que.,	Chapeau, Que.,	"	12th.
Kensington, Que.,	Calumet, Que.,	"	13th.
Danville, Que.,	Elmside, Que.,	"	14th.
Richmond, Que.,	Breckenridge, Que.,	"	15th.
South Durham,	.. ..	"	16th.

2. HORTICULTURE—at Macdonald College, February 8th to 12th.
3. POULTRY—at Macdonald College, February 15th to March 6th.
4. DRESSMAKING — at Macdonald College, January 4th to March 19th.

The object of the short courses offered by Macdonald College is to try to reach the farmer and enable him to improve his prospects and to increase his income.

Many farmers and farmers' sons have not the time to take a regular college course lasting two years or more, but there are many who could find time, at the slack season of the year, to take one or more short courses in one or more branches of agriculture. Macdonald College, in order to help such men, offers lectures in stock and seed judging and short courses in horticulture and poultry keeping.

Farmers' wives and daughters are invited to take the lectures in horticulture, poultry and farm home.

Each course will consist of lectures, discussions, illustrations and demonstrations with materials suited to the courses.

Lectures, some illustrated with lantern slides, and others with demonstrations, will be held at twenty-one centres in the Province. In the majority of cases these places have not been visited in previous years by a deputation of lecturers. At each place three members, at least, of the College staff will be present representing different lines of work. In ten places meetings for farmers' wives and daughters will be conducted by members of the staff of the School of Household Science.

For the Courses in Horticulture and Poultry to be held at Macdonald College men and women students will be received, but none under 18 years of age. There is no other age limit. A registration fee of $1.00 per course is required in advance.

The special course in Dressmaking and Needlework, offered for the first time, will be given by the School of Household Science. The greater part of the time will be devoted to the work in dressmaking but millinery, home decoration, laundry work (including dry cleaning and renovating) and textiles will be given. For this course the tuition fee is:

To farmers' daughters of the Province of Quebec—Free;

Other residents of Canada, $25.00;

Laboratory fee, $5.00, and board at $4.00 per week.

There are no examinations for entrance or at the end of the courses.

Write for illustrated bulletin to

The Principal,

Macdonald College, Que.

November 24, 1914.

MONTREAL MUSK MELONS.—Montreal Island is famous for its muskmelons. It requires careful attention to many details to make mushmelon growing a success.

the standpoint of organization, bringing forth instances, however, where already co-operation was doing good, as in the handling of potatoes.

After luncheon two-minute addresses were given by various delegates at the dining table.

Mr. F. M. Clement and J. E. Britton took up the work of the Ontario Agricultural College and Jordan Experimental Station, showing their experimental work in vegetable growing.

Mr. Clement dealt largely with the cost of Skinner Irrigation. He showed, however, a seedling tomato picked from a vine of Bruce's first and best, which had been crossed with Solium Balbissi; this tomato showed no seed. Mr. Britton took up the cross-breeding work which is being carried on in tomatoes and cucumbers at Guelph and spoke of the fact that they were selecting various vegetables to be grown next year for seed production.

The rest of the afternoon was taken up by three papers by Messrs Logsdail, Macoun of Ottawa and Boving of Macdonald College. They dealt largely with the growing of seed of vegetables in Ontario; in fact, this was a large part of the discussion during the whole meeting.

The question of the war in the seed districts means the discontinuation of much of the seed supply, and it seems necessary that Canada take up seed production for 1916. Methods were given for the production of seed and instances were shown where practically all of the seed had been grown in Ontario.

In the evening Hon. J. S. Duff spoke briefly regarding the interest of the Department in connection with the Vegetable Growers' Association. Speaking further on the question of the growing of seed here in Canada and the standard decision of varieties.

Prof. W. R. Graham gave a very interesting lecture in poultry raising, in connection with vegetable growing. He showed that it depended largely on the man who looked after the chickens as to their interference with the growing crops. He cited instances of his own work in Guelph where chickens have been raised among every vegetable crop except lettuce.

The evening closed with an illustrated lecture by A. H. MacLennan of Macdonald College, showing methods of growing crops as used in various parts of the United States and Canada.

A. H. M.

SEED GROWING FROM VEGETABLES

Short Outline of Methods for Seed Production of the more common Vegetables

SEED production from our ordinary farm roots was treated in the last number of the Journal. The scarcity in the seed supply which is to be feared on account of the war conditions in Europe is not, however, limited to root seed alone. As a matter of fact our energetic and foreseeing Seed Commissioner, Mr. Geo. H. Clark, has recommended the following amounts of vegetables seed to be grown in Canada, during 1915.

RADISH	4200	lbs.
PARSNIPS	2100	"
CABBAGE	1600	"
CAULIFLOWER	105	"
CELERY	1260	"
GARDEN TURNIP	1900	"
" BEET	1900	"
" CARROT	1050	"

What was said in our last article about seed production from field roots applies to garden beets, turnips and carrots as well, and we will therefore limit ourselves here to a short outline of methods adopted in seed production from radish, parsnip, cabbage, cauliflower and celery.

RADISH

(Crosses with other radish varieties)

Seed early in cold bench. If planted too thickly no tap roots are formed. In May the seed roots are planted out in 10 inch squares and watered. The seed generally ripens in August. When ripe the plants are cut off, tied in small bundles and are left to dry in the field. Threshing should be done with good care so that the seed is not crushed or pounded out of the peel. The seed is easily cleaned on a good fanning mill.

Where good stock seed is available, and where one has difficulties in supplying the seed plants with water, 3 to 4 seeds may be laid in each planting hole on above mentioned distance. The planting should, of course, be done as early as possible. When bulbs have formed, the best developed are left to produce seed. This method, however, is not so reliable for obtaining the true type, unless the original seed is extra good.

PARSNIP

(Crosses with other parsnip varieties)

One of the hardiest of all vegetables, therefore can without any danger be left in the ground over winter. In spring time the best roots are selected and planted out in 24 inch squares.

Seed does not ripen uniformly (August-September), the umbels must therefore be harvested in turn when the seed has attained a brownish colour. The umbels are spread out to dry, or are put in bags of open cheese cloth and hung up in airy place.

CABBAGE

(Crosses with other Cabbage varieties).

Three different methods are commonly used:

1. Harvesting in October-November, storing in cellar or pit, and transplanting in spring.
2. Harvesting in October-November, and immediate transplanting in trenches where it is left to grow seed.
3 Growing in trenches where all *good* plants are left over winter for seed production next spring.

In the two last instances, which are more to be recommended than the first mentioned, the soil is hilled up against the cabbage in the fall, and the plants are further protected against frost with spruce branches, leaves, or some other insulating material.

If the heads refuse to burst in spring time, one can assist the flower stalks by making a cut with a knife crossways over the head, remembering that the cuts should not be made so deep that they will injure the seed stalks. The cabbage plants flower in June, and the seed ripens rather unevenly in July, consequently the harvesting has to be done at successive stages.

CAULIFLOWER

(Varieties intercross)

Seed growing from this plant is difficult and to a large extent dependent on circumstances, and this is the reason why the seed is generally expensive.

The method, first in use, to store the plants over winter in cellar or pit, has been almost entirely abandoned in recent years, as it invariably results in considerable rotting and loss of plants.

In localities with mild winter climate the seed is planted in September in benches which are kept open as much as possible over winter. The cauliflower is then either transplanted early in spring or is left in the benches to flower and set seed. All plants which have not formed perfect heads before the 1st of July should be discarded for seed production, as the seed will ripen too late. The flowers appear in July-August, and the seed matures in September-October. When ripe, the stalks should be gradually cut off and spread out on a sheet in a dry and airy place. This method would scarcely be practicable in most parts of Canada where the winters are too severe to allow proper airing of the benches. For Canadian conditions we will probably have to grow the plants in greenhouses so as to have them ready to plant out in spring.

The cauliflower requires a good deal of moisture, and it is questionable if seed can be grown successfully without irrigation or watering.

CELERY

(Varieties intercross)

In localities where the winters are not too severe it is possible to leave the seed plants in the ground. Good reliable foundation stock is, however, necessary for this method. The plants should be covered in hard and dry frosts. It is not advisable to bleach the seed plants, because the bleaching always causes a certain amount of weakness.

The seed ripens in August-September and maturity is easily recognized as the seed takes on a light brown colour. The stalks are cut off and are left to dry in the field. When quite dry the seed is threshed and cleaned.

Where winters are more severe, plants must be taken out of the ground and stored in a cellar or a pit.

Seed growing from radishes offers very few difficulties, parsnips and celery seed production is also comparatively easy, and many growers will still be able to preserve some plants of these. Where cabbages have been stored without being trimmed it might also be worth while to save some heads for seed production next spring. In regard to cauliflower we would appreciate very much if some of our Quebec greenhouse owners would try out the method recommended for Canadian conditions and report the results to the Editor of the Journal. In all cases it should be remembered that different varieties belonging to the same plant species must be grown a sufficient distance from each other, say 200 yards, in order to eliminate the danger of intercrossing.

PAUL A. BOVING.

In Charge of Root Crop Investigation,
Cereal Husbandry Dept., Macdonald College, Que

ANNUAL MEETING OF THE ONTARIO ENTOMOLOGICAL SOCIETY

Held in Toronto, November 5th and 6th

THE fifty-first Annual Meeting of the Ontario Entomological Society was held in Toronto, November 5th-6th, under the presidency of Dr. C. G. Hewitt, Dominion Entomologist. Delegates were present from most of the provinces, Quebec being represented by J. C. Chapais, Father Leopold of the Oka Agricultural Institute and Professor Lochhead of Macdonald College. The sessions were well attended, and many interesting and instructive reports and addresses were given on the chief injurious insect pests of the past season. The serious outbreak of army-worms in Ontario and Quebec furnished matter for much valuable discussion.

The President's Address

In his Presidential address Dr. C. Gordon Hewitt took as his subject "Applied Entomology in Canada," and dwelt at some length on its economic advantages and supreme importance with regard to agricultural progress. He expressed his gratification at the general work done by the Society and his regret that the support lent to it was not so good as it might be. The work in the United States, he said, was receiving much more support, both from the Government and the public. However, the nine stations in Canada, he said, were rendering good accounts of themselves. Entomology in British Columbia has made great strides under the able direction of Mr. Treherne. The prairie provinces, Dr. Hewitt said, do not require much supervision, as conditions there are on the whole excellent. Interest is growing rapidly in Quebec, and owing to the advent of the San José scale and browntail moth in Nova Scotia and New Brunswick the authorities in those provinces have given considerable attention to the control of insect pests.

Dr. Hewitt made a concise survey of the work in Entomology done in each of the provinces by their various prominent workers, and gave much praise to the early men who like Dr. Bethune and Dr. Fyles are now old, or like Dr. Fletcher and Dr. Saunders have gone to their rest.

Insects pests of the season

Prof. L. Caesar, of the Ontario Agricultural College, in dealing with the Insects of Ontario for the season, stated that tent-caterpillars were not nearly so plentiful as they had been and many of the pupae had been destroyed by parasites. Lime-sulphur he found to be an unfailing destructive agent. San José scale, he said, was prevalent, but did not appear to be spreading. He recommended thorough spraying, and also added as a rider that the outer twigs should not be neglected. He had seen many trees, which had been religiously sprayed in the centre, ruined because the outside twigs had not been treated. Though aphides were not present in such quantities as in former seasons he advanced the opinion that they seemed to thrive in orchards situated near water. A mixture of sodium sulphide, common laundry soap and water applied as soon as the eggs were hatched had been found effective and has the advantage of being a cheap preparation. Apple-leaf rollers were a pest which had not yet been entirely suppressed and they had caused much damage to Spy apples. The only preparation that seemed to be of any effect was arsenate of lead.

Prof. Wm Lochhead, of Macdonald College, in his address dealt mith the Injurious Insects of Quebec and curtailed his report because many of his subjects had already been discussed. He reported the damage done by tent-caterpillars to be on the downward grade. The bud moth was the most serious pest that the fruit-growers had to contend with; flea-beetles and aphides were also abundant. Prof. Lochhead then read a very interesting paper on J. H. Fabre, the eminent French entomologist, and quoted several excerpts from his writings. Some of the facts concerning the habits of the mantis the pea-weevil and the scorpion were very instructive. Attention was directed by the speaker to the fine literary style.

The Army-Worm

Mr. A. Gibson, Chief assistant to Dr. Hewitt at Ottawa, gave several important statistical facts concerning the outbreak of the army-worm in Canada. Almost every county in Ontario had suffered from its ravages, the worst outbreak being in Brant county. The active little worm had been at work most in the Provinces, Quebec, New Brunswick and Nova Scotia, and was invariably found to be most prevalent in low-lying lands. He estimated the total loss at $300,000.

The next report was delivered by Mr. A. W. Baker, of Guelph. He spoke very ably on the activities of the army-worm in Ontario and expressed his satisfaction at the way farmers had co-operated to control the outbreaks. He had discovered that the pasture crops had suffered very heavily and that owing to this loss, eighty per cent. of the cows had been sold. Grasses were attracked first, then in order, timothy, oats, corn, barley, millet, wheat and rye. Peas did not suffer at all, the worms preferring the more succulent grains. The most satisfactory control measures taken were found to be the trench system. This, if properly constructed, that is, from 15 to 18 inches in depth and well squared off, was infallible. Spraying was tried but gave very poor results. Poisoned bran, scattered over the fields, proved a very effective agent.

Other subjects of varying importance from an economic standpoint were discussed by Mr. J. M. Swaine, Mr. Ross, Dr. Fyles and others; and a lecture on the habits of spiders, illustrated with lantern slides, was given on by Prof. J. H. Comstock, of Cornell University, Ithaca, N. Y., which was extremely interesting.

The election of officers resulted mainly in the re-election of former officials.

PROGRESS IN FRUIT GROWING IN QUEBEC

The Address of the President—Prof. T. G. Bunting—at the Annual Meeting of the Pomological and Fruit-growing Society of Quebec, held at Macdonald College, Dec. 2nd and 3rd

I have much pleasure in opening the 22nd annual winter meeting of the Quebec Pomological and Fruit Growing Society and welcoming the members, delegates and friends who have gathered in attendance from various parts of the province. Our Secretary has been very painstaking in preparing the programme, which includes many of our local speakers and some from distant points, and I am sure we will hear much of interest to all of us.

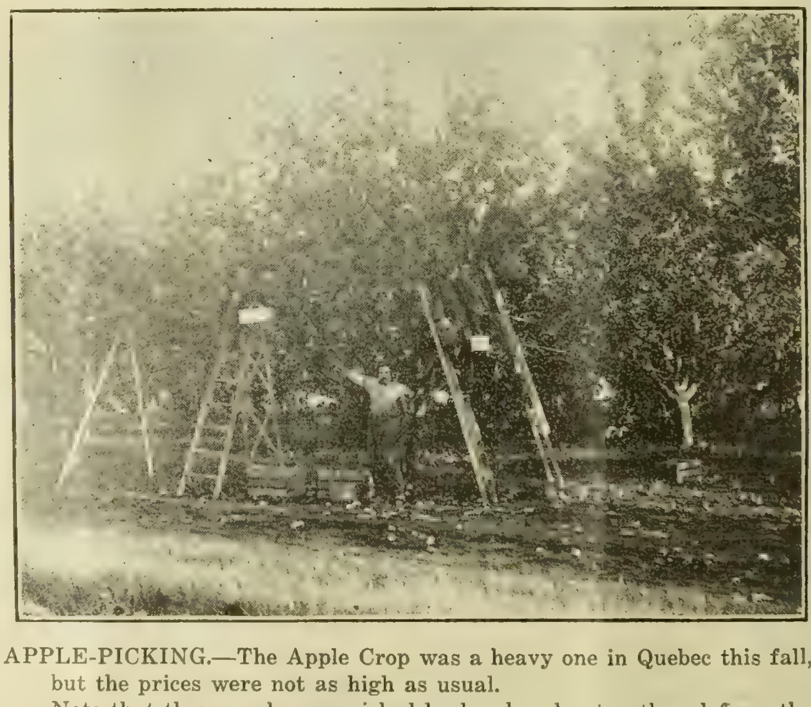
The past season has been quite favourable for fruit production in all lines, although the berry crop suffered somewhat from drouth, which was, in a measure, made up by quite satisfactory prices. The year has produced one of the cleanest and finest crops of apples on record and our sister provinces have shared in a bountiful and high quality crop.

Price of Apples

The war has affected the price of apples to a considerable extent, owing to a lessening of the demand for apples on the European market and to an uncertainty and higher rate on ocean shipments, but Quebec has suffered less in this respect than Ontario and Nova Scotia, and on the whole the growers have received fairly good prices.

Demonstration orchards

The demonstration orchards at Covey Hill, Abbotsford, Rougemont, St. Hilaire and St. Joseph have all had good crops of apples and they have been a most practical demonstration in their respective sections of good methods in apple growing. As a result the fruit growers of this province owe much to the Quebec Department of Agricul-



APPLE-PICKING.—The Apple Crop was a heavy one in Quebec this fall, but the prices were not as high as usual.
Note that these apples are picked hy hand and not gathered from the ground after being shaken from the tree.

THE FARM AND FARM CROPS

DISTRIBUTION OF SEED GRAIN AND POTATOES

From the Dominion Experimental Farms, 1914-1915

BY instructions of the Minister of Agriculture, a distribution of superior sorts of grain and potatoes will be made during the coming winter and spring to Canadian farmers. The samples for general distribution will consist of spring wheat (about 5 lbs.), white oats (about 4 lbs.), barley (about 5 lbs.), and field peas (about 5 lbs.). These will be sent out from Ottawa. A distribution of potatoes (in 3-lb. samples) will be carried on from several of the experimental farms, the Central Farm at Ottawa supplying only the Provinces of Ontario and Quebec. All samples will be sent free, by mail. Applicants must give particulars in regard to the soil on their farms, and some account of their experience with such kinds of grain (or potatoes) as they have grown, so that a promising sort for their conditions may be selected. Each application must be separate, and must be signed by the applicant. Only one sample of grain and one of potatoes can be sent to each farm. If both samples are asked for in the same letter, only one will be sent. Applications on any kind of printed form cannot be accepted. As the supply of seed is limited, farmers are advised to apply early; but the applications will not necessarily be filled in the exact order in which they are received. Preference will always be given to the most thoughtful and explicit requests. Applications received after the end of January will probably be too late. All applications for grain (and applications from the Provinces of Ontario and Quebec for potatoes) should be addressed to the Dominion Cerealist, Central Experimental Farm, Ottawa. Such applications require no postage. If otherwise addressed, delay and disappointment may occur. Application for potatoes from farmers in any other Province should be addressed (postage prepaid) to the Superintendent of the nearest Branch Experimental Farm in that Province.

J. H. GRISDALE,

Director, Dominion Experimental Farms.

THE PRODUCTION OF REGISTERED SEED IN CANADA

THE REGISTRATION OF BREEDING STOCK, PLANT AS WELL AS ANIMAL

THE breeding of pure-bred live stock in Canada is a wide-spread and rapidly growing practice. It has justified itself by the results of long years of patient effort on the part of individual breeders who have amply demonstrated that 'breeding' counts. Standards of excellence have been adopted by the various associations of different breeds and these have been rigidly adhered to. An important, if indeed not an essential phase of the industry has been the recording, in the National Live Stock Records at Ottawa, of the pedigrees of animals which have shown themselves to be entitled to such official recognition.

The production of "Registered Seed" in Canada, while of more recent origin, is also developing rapidly into a large and important industry. While the exact method of reproduction in plant life differs from that in animal life, yet the principles of reproduction and the laws governing the transmission of characters from parent to offspring are essentially the same. It is consequently possible to keep records of the main line of descent in plants as well as in animals. For this reason the system of producing 'Registered' seed and of keeping records of the progeny thereof is fundamentally the same as that which has been adopted in connection with the Live Stock industry.

THE SEED GROWERS' ASSOCIATION

The organization which has the official registration of pure-bred seed in hand is known as the *Canadian Seed Growers' Association.* This Association had its origin in a seed-grain competition which began in 1900 and which lasted for three years. The aim of the competition, requiring as it did a careful selection of seed, was to provide visible demonstrations as to the great practical advantage of using 'well-bred' seed. At the end of the Contest the results proved so promising that the above Association was organized with a view to promoting through organized effort a continued interest in the question throughout the whole Dominion.

The Association is a voluntary one, that is it is "outside' the Government. Owing however to the great value of its work to the country and to the extent to which it may extend the work of such Government branches as the Experimental Farms and the Seed Branch, the Honourable the Minister of Agriculture provides funds to assist in carrying on the work. Additional funds are secured through inspection fees, but no membership fee is required.

The officers of the Association consist of a President, three Vice-Presidents, a Secretary-Treasurer, an Executive Council and a Board of Directors consisting of twenty members. Through a recent arrangement, the different Provinces in Canada are to nominate the Directors, each Province being allowed two. In view of this arrangement, the Association is really an inter-provincial body rather than a federal one in the sense in which the term "Federal" is ordinarily used.

---

ture and to our Secretary, Mr. Reid, for what has been accomplished during the past four years. I had the pleasure of visiting the Demonstration orchard at Abbotsford just as the fruit was being harvested and I never saw a finer lot of Fameuse apples than those in this orchard. Judging from the interest already being taken in these orchards it is expected that many other orchards will be renovated and cared for in a similar manner, for undoubtedly they can be made to pay as never before. We will look forward with much pleasure to a full report of the results accomplished in the demonstration orchards.

The Orchard as an Investment

I very much regret that more attention is not being paid to the establishment of new apple orchards in our better known fruit districts. True, many trees are being planted, but these are more as fillers for old orchards in which vacancies have occurred from various causes, or scattered plantings that are not receiving proper attention. Apple orcharding has not been overdone and is not likely to be in Quebec for many years; and he who is willing to plant five, ten, or more acres and take proper care of them for the next ten years will have an investment worth $500. per acre. Men and capital from Montreal, and elsewhere in Quebec, have gone to British Columbia to develop their orchard lands while right here within a few miles of Canada's largest city we have cheap orchard lands which, for McIntosh and Fameuse, cannot be beaten on the continent. In spite of the low prices of apples this year, Fameuse and McIntosh have sold at the top of the market, and only recently I heard of a shipment bringing $5.50 per barrel. At the present time it would be next to impossible to locate a carload of No. 1 fruit of these varieties in the province. The market has not been adequately supplied with these varieties.

I trust that the next few years will see many new orchards, particularly of McIntosh and Fameuse apples par excellence,—planted and cared for. No one can any longer plead ignorance of proper methods of planting and caring for such orchards.

Co-operation

Co-operation is yet new in the province among fruit growers, but a good beginning has been made. Let us profit by the Pacific Fruit Growers who have built up a wonderful organization that has standardized their pack and enabled them to put their crop on the market at a less cost and to reach out for new markets. In this way they have benefited the consumer in giving him his dollar's worth and at the same time they have received a fair share of the dollar.

Death of Mr. McNeill and Dr. Saunders

We all regret the untimely death of the late Mr. A. McNeill, who was for many years closely identified with the Fruit interests of Canada. In this death we have lost an earnest worker and a close friend. The year has also witnessed the passing of the late Dr. Wm. Saunders, who was for twenty-five years Director of the Dominion Experimental Farms and to whom we owe much for the advancement of horticulture in all its lines.

Mr. D. Johnson, New Fruit Commissioner

The fruit growers of Canada are to be congratulated in the choice the Hon. Martin Burrell has made in filling the position of Fruit Commissioner, by the appointment of Mr. Dan Johnson of Forest, Ont. Mr. Johnson has been a life long fruit-grower and has played a very prominent part in the work of the Ontario Fruit-Growers' Association for the past ten years, having at one time served as President of that Association. Mr. Johnson has advanced ideas and a broad vision; we expect much of his stewardship of the Fruit Commissioners Office at Ottawa. Shortly after Mr. Johnson's appointment, the Hon. Martin Burrell called a fourth Dominion Fruit Conference, at which nine delegates from this province conferred. We had a report of this conference at our summer meeting at Abbotsford and a full report of the entire proceedings will shortly be issued.

Advertising Campaign

We owe much to the Hon. Geo. E. Foster for inaugurating an apple advertising campaign through the Dominion Department of Trade and Commerce. This campaign has done much to stimulate the home consumption of the apple, and we hope this good work already begun will be continued. It is a line of development along which our co-operative societies could do much, as already the western co-operative societies are doing in advertising the apple.

Canada has no National Dish at present, and what food could better fill this position than the King of Fruits, the apple? and it is to be hoped that the Hon. Mr. Foster in his apple advertising campaign may see fit to have the Government establish the apple as Canada's National Dish.

I cannot pass without referring to the good work of our Secretary who has for many years devoted his efforts to this society and to the fruit interests of the province in general, and to whom much of the credit of the Society's work is due.

An excellent programme has been prepared which should be most profitable and we hope you will enter into the discussions of the different papers as presented to you at this convention.

PRODUCING, PROPAGATING AND REGISTERING SEED

The methods of producing, propagating and registering pure-bred or "Registered Seed" are in the main as follows: The actual "breeding" work is done for the most part by experts at the Experimental Farms and Agricultural Colleges, as these institutions are specially equipped and financed for this purpose. Such institutions however are not in a position to control the *propagation* of pure-bred stocks in a large way throughout the country generally. Without some efficient and systematic control pure stocks of seed, when once in the hands of the average farmer, would quickly lose their identity and in many cases would deteriorate in value through lack of proper care. The conservation of all that is good and useful in improved seed stocks together with their judicious multiplication and control throughout the country is one of the chief functions of the Canadian Seed Growers' Association.

The system by which Registered seed is produced by members of the Association is relatively simple. The chief concern, in most cases, is to maintain the purity and high quality of the original stock. This applies chiefly to those plants which naturally self-fertilize. In the case of plants which cross-fertilize, such as corn, clover, and many grasses, the system is designed not only to enable the grower to maintain a relative constancy of the sort, but also to afford him an opportunity of producing advantageous changes in the type.

Where possible, the original stock is procured directly from an expert at an Experimental Farm or Agricultural College. If this official is prepared to take the responsibility for the purity and quality of the seed, this seed is accepted by the Association under the name "Elite Stock Seed". If this class of seed cannot be had, it is usually possible to obtain its immediate progeny, either from an experimental station or from another member of the Association.

The progeny of Elite Stock Seed up to and including the third generation descended therefrom may, if absolutely pure and of suitable vitality and quality, be recognized as "Registered Seed" by the Association, and as such be given official and public recognition.

The greatest possible care is exercised by the grower, when propagating "Registered Seed", in order to insure a pure product of superior quality. This necessitates special attention to such matters as choice and treatment of soil and to the cleaning and grading of the seed produced. Only seed which is pure as to variety, entirely free from weed seeds and seeds of other cultivated plants, which is well-matured, plump, clean, sound, free from disease and of good color, and which shows when tested a germination equal to that recognized for good seed under the Seed Control Act, can be accepted for registration as "Registered Seed".

THE COMMERCIAL HANDLING OF REGISTERED SEED

In the commercial handling of Registered Seed, the Regulations require that each field of seed intended for registration be inspected by an expert during the growing season, the said expert sending a detailed report on the general performance, purity, freedom from weeds and diseases of the crop examined, to headquarters.

After threshing, the grower is asked to send to headquarters a sample representing the seed he is offering for sale. This sample is tested for vitality and analyzed for purity. Should the official sample be accepted as suitable for registration, the grower is authorized to put up his seed in sacks, and hold these in readiness for a second inspection. If, on examination, the inspector finds the seed in these sacks as good as that sent in for examination, he closes and seals the sacks, attaching to each a metallic seal which bears the name of the Association. A special tag is placed under this seal, which bears the name of the variety, the certificate number and certain other information.

All seed offered for sale is listed in a Seed Catalogue which is prepared and widely distributed by the Association throughout Canada.

CO-OPERATION BETWEEN THE PROVINCES AND THE ASSOCIATION

In view of the fact that each Province has a considerable financial interest at stake, and that it has special facilities for advancing and supervising this sort of work the Directors, representing as they do the different Provinces, have agreed that each Province should take upon itself the responsibility of initiating and supervising the work of growing Registered Seed, including the inspection of fields, within its borders. The records, on the other hand, as in the case of Live Stock, shall be kept at Ottawa, which place has been chosen as head-quarters of this Association. This arrangement obviates the necessity of each Province having to keep its own registry office, while at the same time it gives a national status to the whole organization. Wherever there is interprovincial or international trade, this is particularly desirable.

Although the field inspection is done by Provincial officers, the final inspection of seed in sacks offered for sale is made by officers appointed by and under the direct supervision of the head-office.

SEED CENTRES

Until quite recently the work of growing Registered Seed has been in the hands of men who have been widely scattered, a situation which necessitated each member growing his own 'Elite Stock Seed'. This resulted in the amount of registered seed available at any point being comparatively small. In view of the fact that many buyers require seed in car-load lots, special efforts have been put forth during the past two years to consolidate the work in centres which are known to be suited to the production of high class seed of given kinds. To accomplish this, provincial representatives, realizing an opportunity to develop a profitable business among their constituents, have taken the initiative. Where a number of men in a district organize themselves into a regularly organized 'Seed Centre', one or two of their number may be chosen to produce for the centre the Elite Stock Seed or its immediate progeny which is required as a basis for propagation. This arrangement renders it unnecessary for every grower to produce his own Elite Stock Seed, and at the same time makes the production of large quantities of high class seed at single points relatively simple. Thus far between fifty and sixty of these Centres have been established throughout different parts of Canada. Not all of these will be successful, but the present outlook would indicate that the majority will do excellent work.

L. H. NEWMAN,

Sec'y Canadian Seed Growers' Association

PUMPING FROM RIVER TO STABLES

Editor, Journal of Agriculture.

QUESTION.—I get my water from a river about 200 ft. from my farm buildings. This river rises and falls considerably during the course of the season. At present I haul the water and find it difficult especially when the banks are soft. I have a 2½ h. p. gasoline engine and want to rig up a pump to supply my buildings. Will you please tell me how to go about this? Please state what size cylinder to use and what size piping?

Answer:—You do not state the vertical fall from your buildings to the lowest water level. If this is not more than 25 ft. you can place your gasoline engine and pump in your buildings. In this case use 1½ "galvanized iron pipe and put it 4½ ft. underground to avoid frost. Make the slope downhill from your buildings to the lowest water level. Put a good strainer on the end of the pipe in the water. Put the strainer on the end of a short piece of piping connected to the main pipe by an elbow. Make the strainer point down stream so that it will not become clogged. On the river bank above high water put in a swing check valve with a leather seat, one that you can open for examination. Leave a dry well above this valve. Use a 3" cylinder.

If your buildings are at a greater elevation than 25 ft. you may be able to put the cylinder below the body of the pump and thus bring it within 25 ft. of the lowest water level.

If you cannot get the cylinder within 25 ft. of the lowest water level you will have to place your engine and pump near the river so that you can get them within this vertical height. We advise you to put in an elevated tank in the hay mow over the stables. The pipe will be protected by the heat of the animals and the tank by the hay.

C. J. L.

STABLE PUMP FOR DISTANT WELL

Editor, Journal of Agriculture.

QUESTION.—I wish to put a pump in my stable to draw water from a well 140 feet away. The well is 18 ft. deep and there is 5 ft. of water in it. The top of the well is about on the same level as the floor of the stable. What size pipe should I use and what kind of pump? I wish to discharge the water into a trough at the spout. How deep should the pipe be placed to protect it from frost?

Answer:—We advise you to use galvanized iron pipe not less than 1¼" in diameter. It would be better still to use 1½" pipe as it would make it easier to pump. You could use an ordinary pitcher pump, this is the cheapest. Run the pipe at a depth of about 4 ft. underground to the well and put a good tight cover over the well so that the cold air will not penetrate.

If there is danger of the pipe freezing in the stable, use a cistern pump with a cylinder placed 4 ft. below the stable floor. Put a small ⅛" hole just above the cylinder. This will allow the water to drain down to this point and prevents freezing. If you use this arrangement put a foot valve on the end of the pipe in the well so that the water will come quickly when you start pumping.

C. J. L.

SOIL MANAGEMENT IN RELATION TO YIELD AND QUALITY IN SEED

By L. S. Klinck, Late-Professor of Cereal Husbandry, Macdonald College, P.Q.

(Address before the Canadian Seed Growers' Association, 1914)

TO compress within the brief compass of a paper, not to exceed forty minutes, the essentials in successful soil management in relation to yield and quality in seed is a task too difficult for accomplishment. I shall, therefore, confine myself largely to principles, although I am well aware that a brief statement of principles is very apt to be misleading unless broadly interpreted; but I am also aware that an attempt to treat at length the modifications which, in practice, confront the farmer in the management of land, would be equally open to objection because necessarily incomplete.

Soil manegement is not an exact science. Important as are principles, the prime factor in the entire situation is the farmer himself. He must be a man who has an intelligent knowledge of his soil, born of a first-hand working acquaintance with it. He must be a man who studies the likes and dislikes of his crops. In soil management the necessity of exercising fine judgement in many points, which are all too frequently regarded as of minor importance, must never be forgotten. Here, as elsewhere, applied knowledge of details counts.

Soils and crops are inseparable. Crop yields are determined by the amount and availability of the plant food in the soil, and by textural and moisture conditions, as much as they are influenced by the character and quality of the seed sown. The factors influencing yield, while not always completely under the control of man, are fairly well known and appreciated; the factors influencing quality have been less studied and are, therefore, less perfectly understood.

The necessity for a better working knowledge of the principles underlying the successful management of our prevailing soil types, in relation to such fundamental points as drainage, tillage, manuring, rotation and cropping is evident; but the equally pressing need for more definite information relating to those factors which influence quality has as yet attracted comparatively little attention.

The character of the soil to be tilled, and the kind of crop to be grown, determines, in large measure, what constitutes good soil management. A knowledge of the excellencies and of the defects of the soils to be managed is basal. For example let us take two common soil types and see how the application of these general principles works out in practice.

CHARACTERISTICS OF SANDY SOIL

A sandy soil absorbs and retains heat well, allows water to percolate through it freely, offers but slight resistance to the circulation of air and naturally dries off more quickly and warms up more readily than clay. Owing to the coarse nature of the particles, and the absence of any binding constituent, sandy lands never puddle or bake. Moreover, frost does not exert the same pulverizing action on sand that it does on clay, and as such soils can be ploughed early without injuring their mechanical condition, fall ploughing, with them, is not as important as it is with clay lands.

For sandy soils, shallow cultivation is best. As the principal defect with such soils is their extreme openness, the system of tillage adopted should be such as to compact, rather than to increase, the space between the soil particles. Manures, when applied, should be fairly well decomposed in order to have the consolidating or binding effect of the humus. Frequent light applications of fertilizers will prove more profitable than heavy infrequent ones.

Clay soils, on the other hand, call for very different treatment. Naturally fine in texture, extremely tenacious, easily puddled when wet and readily baked and cracked when dry, these soils, unless drained, are cold and wet in the spring. Unless exposed to the disintegrating action of frost, made possible by ploughing in the fall, such soils are apt to be in such poor mechanical condition as to necessitate a great amount of labour in getting them into sufficiently good tilth to make a fine seed bed. In such soils the danger of loss of plant food by leaching is reduced to a minimum; water is held tenaciously and its movement in any direction is slow. Their greatest defect —extreme heaviness—may be overcome by thorough under draining, deep tillage and the incorporation of vegetable matter in the form of fresh strawy manure or by turning under a green manure crop, as rye, buckwheat, or clover.

DRAINAGE

Wherever needed, thorough drainage is essential to good soil management. Underdraining, while more expensive than surface draining, is unquestionably, wherever practicable, the more effective and satisfactory method. Underdraining lengthens the season for profitable tillage; results in better textural soil conditions at a minimum expense for fitting; ensures larger returns to the acre of more evenly matured and consequently better quality crops; admits of the successful growing of a wider range of crops than would otherwise be possible, and so contributes to the holding of weeds in check and to the improvement of the physical condition of the soil.

TILLAGE

Ploughing is the basic operation of all cultivation. Of all tillage operations it is the slowest and most expensive, and of all cultural operations it is probably the least understood. As a result, ploughing is all too frequently poorly done, and in many cases careful ploughings have given way to mere surface scratchings.

The increased cost of farm labour, and the greater efficiency of the implements used in surface tillage, have contributed in no small measure to the prevalent idea that time spent in good ploughing is not profitably employed. On some soils, it must be admitted, we have learned to get along with fewer ploughings than was formerly thought economical, without sacrificing efficiency, but this, in itself, constitutes one of the strongest reasons why ploughing should be well and intelligently performed whenever it is done.

Good ploughing is no less essential to-day than it ever was. True, the practice of setting a toppy comb on a furrow is no longer regarded as the crowning test of good ploughing. That standard was rightly abandoned long ago. To-day a clear distinction is made between fancy ploughing and good ploughing; and in the near future, when we have come to appreciate better the cultural requirements of different soils, our ideas as to what constitutes good ploughing will undergo further changes.

Thorough surface cultivation will never displace or stand out pre-eminently over good ploughing so long as the eradication of weeds and the economical preparation of a good seed bed are prime considerations in cultural methods.

The time and manner of ploughing should be governed by soil conditions and by the objects sought. Good ploughing in the fall may not be good ploughing in the spring even in the same field. For example, flat-furrow ploughing is best adapted for accomplishing the rapid decomposition of sod in summer; but if the sod field cannot be broken up at this time, a very different type of furrow will be called for when the field is ploughed in the fall. Then, instead of the shallow flat-furrow, the deeper lap-furrow will prove more effective. Within limits, the heavier the land, and the more it stands in need of underdraining, the more pronounced should the lap be. If the sod land, however, cannot be ploughed during the summer in full, it may be broken up in the spring. In this event it should be ploughed at a less depth, and with a wider furrow, than would be best for fall ploughing. Moreover, in spring ploughing the aim should be to do the greater part of the rough pulverizing by means of the plough. A bold, overhanging mouldboard will effect the desired result most economically and will reduce to a minimum the cost of fitting the land by surface cultivation.

It will be seen, therefore, that at least three distinct kinds of furrows can advantageously be employed in the same field, depending upon the work to be done. Shallow, flat-furrows answer best for July and August ploughing; narrower, deeper, unpulverized lap-furrows should be used in fall ploughing, while the comparatively wide, shallow, pulverized furrow-slice will give best results in the spring.

The time to begin the preparation of land for field crops is the preceding fall. With but few exceptions, fall ploughing has proved better practice than spring ploughing. Fall ploughing induces the germination of volunteer grain, prevents the seeding of weeds, holds injurious insects in check, equalizes farm labour, makes conditions favourable for the absorption and retention of rainfall and snowfall, facilitates the pulverizing action of frost and enables the land to be seeded much earlier in spring.

In sowing grain on land which has been planted with corn the preceding year, and on which the corn roots have been turned under, considerable surface cultivation is generally necessary. When this condition obtains, the great essential is to compact the soil rendered too loose and open by the presence of corn stubbles. The roller serves a useful purpose under these conditions, but as its compacting influence is apt to be confined to the upper few inches of soil, it should be preceded by the disk cultivator set to act as a sub-surface packer. On such lands, unless the soil is compacted, there is a too free circulation of air, which dries out the soil more rapidly than moisture can be brought up by capillarity, with the result that the crop, and especially young clover, is apt to dry out and burn up during hot, dry weather. In such cases, and they are by no means rare, the failure to get, and to maintain, a satisfactory stand of grass and clover seeds is directly attributable to a lack of sufficient soil moisture, which might have been conserved by intelligent preparation of the seed bed.

Failure to secure good crops, and especially the inability to maintain a satisfactory stand of grass and clover seeds, is all too frequently atributed to a lack of fertility, whereas the fact is, the supply of moisture is inadequate, and hence, in such cases, moisture, not fertility, becomes the limiting factor in crop production.

The ancients tilled the soil primarily for the controlling of noxious weeds; the farmers of mediaeval times laid great emphasis, in their tillage operations, on fining the soil so that the plants could feed on the small particles of earth directly; the farmer of to-day has learned to till for tillage sake. He knows tillage is not manure in the sense in which Tull understood it, but he appreciates its restraining influence on weed growth, he knows it is a potent agency in rendering plant food available, in improving the physical condition of soil and in conserving moisture adequate to meet the requirements of abundant crops.

(To be continued)

CONCRETE FENCE POSTS

WHERE cement is easily obtained and proper aggregates are available, farmers are finding it profitable to substitute concrete posts for posts of wood. Wooden posts are temporary at best, and in some localities decay within a very few years.

Concrete posts are indestructible, keep in better alignment than wooden posts, and, under normal conditions, cost little more if as much as the latter. In some sections of the country they can be made cheaper than a good wooden post. Their fireproof and everlasting qualities make them especially desirable. A simple type of post can be easily made on the farm. A farmer may make his own molds, or he can purchase them from one of the various concerns that manufacture molds on a large scale. Farmers sometimes club together in purchasing factory or metal molds, thus reducing expense to the individual. This is a very good plan as metal molds do not warp or decay.

The easiest and cheapest wooden mold to make is the straight mold, or one for a post which does not taper. Such molds are merely long boxes having various devices for making the molding of the post a simple matter. On account of the amount of lumber saved and the ease with which these molds are filled, straight molds are generally made in "sets" or "gangs," by constructing several side by side with a continuous bottom and end pieces.

LIVE STOCK

COTTONSEED MEAL

Its Value as Feed; its Place in the Ration; its judicious Use and its Dangers

JUDGING by the amount of cottonseed meal being offered for sale and the price at which it can be bought, it would seem reasonable to assume that this winter will see an unusually large quantity of this feed sold and consumed in this country. Many farmers will see it and feed it for the first time. Because of this, and the fact that if not judiciously employed the results may not be very satisfactory, a little study of it at this time should be both interesting and profitable.

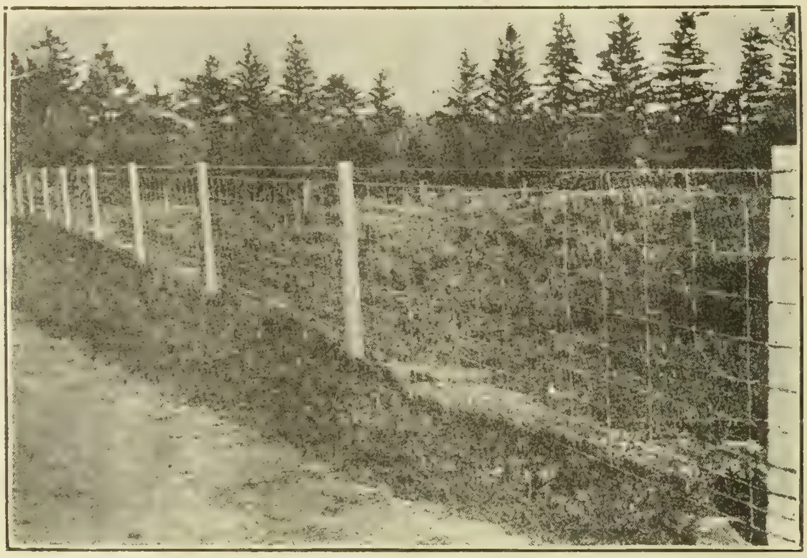
SOURCE OF SUPPLY

Cottonseed meal is a by-product feed and like all other feeds of this class may vary considerably in quality. The great source of it for Canadians is the United States. Cotton is grown in a number of countries, but with regard to the international trade in the feed by-product of this industry the United States leads all other countries, exporting in 1912 over seventeen million dollars worth. Egypt and India also figure prominently in the trade and contribute large amounts to the European feed market. Much as the United States exports, she consumes a great deal more herself. In this connection it may be interesting to state that for the year 1912 the official value given for the cotton crop with its by-products in the United States, was $860,000,000. The by-products include cottonseed oil and cottonseed cake or meal, the value of the latter for the same year being given as $117,000,000. At one time, and that a very few years ago, the seed of the cotton plant was regarded as a nuisance. To-day, however, thanks to science, the United States is able to realize an enormous profit from it.

In the process of manufacturing cottonseed oil the kernel and hull of the seed are separated. The kernels are then crushed, heated, placed between cloths, and subjected to hydraulic pressure to separate the oil. The residue is a hard, yellowish, board-like cake, and is shipped to European countries in this form as cottonseed cake. For consumption in the United States and Canada this cake is ground to a meal and known as cottonseed meal. It will be seen that in the American process the hulls are not included directly, and for this reason it is known as 'decorticated' cake. The 'undecorticated' cake, common on the European market, includes large quantities of the hull, ground and mixed with the straight residue, and has a lower feeding value. Ordinarily Canada takes a small portion of the seventeen million dollars worth from the United States, the bulk of it going to the European market, Germany taking a large share, hence the abundance of supply here at present and the corresponding price.

A RICH FOOD

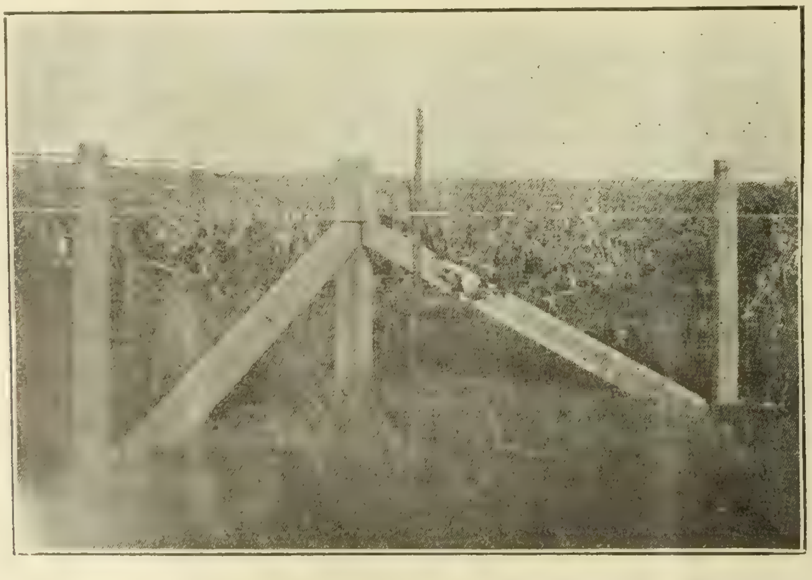
Cottonseed meal varies in composition, but in all samples it contains an extremely large amount of protein in very digestible form, being one of our richest foods in this constituent. It is comparatively low in the constituent known as carbohydrates but high in fat. Both of these are valuable for their energy-producing power but the chief value in cottonseed meal as a feed lies in its high protein content. When a price quotation is received it should always be considered for the particular sample and its analysis. Two grades are frequently offered for sale here, under different brand names, analysing 41% protein and about 38% respectively, although samples may test either higher or lower than these amounts, the difference in value between the two grades mentioned being about 10 cts. per cwt. or $2.00 per ton.



A Line of Concrete Posts with Wire Fencing Attached.

Posts should be reinforced with a rod or wire in each corner. In most cases round bars three-sixteenth or one-fourth inch in diameter are used.

After the molds have been oiled or soaped, the concrete should be placed in them at once. If, for any reason, the concrete stands thirty minutes before using, it should be thrown away and a new batch mixed, for cement, if it has once partially set, makes weak, dangerous concrete, even though it is retempered by turning or adding water. After the molds are filled evenly to the depth of three-fourths of an inch or one inch, according to the spacing of the reinforcing rods or wires, the reinforcement should be laid in, properly spaced by means of at least three "fool-proof" wire spacers. The concrete should then be poured in until the molds are filled within three-fourths of an inch or one inch of the top, when the remaining reinforcement is fitted in place in the manner descrided above and the molds are completely filled. To render the concrete more compact, a crowbar or a pinch bar should be placed under each corner of the mold successively and moved up and down quickly. This vibration makes the concrete more compact by shaking out the air bubbles, but there will be very few of these bubbles if the concrete is thoroughly mixed and of proper consistency. If desired, the exposed corners of the post may be bevelled with an "edger" and the open face given a neat finish by using a trowel immediately after the surface water has been absorbed and before the concrete has become too hard.



Concrete Field Posts. Braces at Corner Post are also Concrete.
How to make Concrete Posts.

The following are exceedingly important precautions:

Do not expose the newly made posts to wind, hot sunshine or frost.

Do not remove the mold from the green post until thoroughly hardened, which generally requires two or three days. Even then the post must remain on the bottom board in the shade and not be disturbed for at least a week. During the first two days keep the post wet and covered with canvas, burlap or other clean material, and dampen it thereafter each day for about a week.

THE MIXTURE

In mixing the concrete, if unscreened "bank-run" gravel is decided upon, it should be used in the proportion of 1 part of cement to 4 parts of gravel. For crushed rock or screened gravel (which is much better than "bank-run" gravel), the concrete should be used in the proportion of 1 part of cement, 2 parts of sand, and 4 parts of rock or gravel. All measurements should be made with the material poured loosely into the measuring box, and the box, when full, should be carefully levelled.

PLACE IN RATIONS

The fact that this feed carries so much protein makes it specially suitable for certain classes of stock and probably at its best for milch cows. Protein is highly important for milk production; cows must have it in sufficient quantity. It is the one constituent in the ration for which a substitute will not do and what makes this more significant is the fact that any grain mixture ordinarily available on the average farm will not supply protein in sufficient quantity. Thus it is necessary to buy some food rich in this constituent if the cows' requirements are to be fully met and the most economical production obtained. There are a number of feeds in which this can be obtained in large quantity, such as oil cake, gluten meal, pea meal, bran, etc. Some of these are valuable for other purposes besides supplying protein, and this fact sometimes makes a choice difficult.

Again, cottonseed meal in spite of its large protein content has certain shortcomings in certain rations and these must be considered. However, it may be said that if all requirements of the ration, with the exception of protein supply, be satisfied, at present prices cottonseed meal will furnish this constituent for less money than will any other feed. I have seen quotations as low as $30.00 per ton for a high grade, thus furnishing protein for much less than 4 cents per pound. Oil cake at $32.00 per ton, a common quotation now, will furnish it for about 5 cents per pound; gluten feed at $30.00 for about 7 cents per pound and bran at $24.00 for about 10 cents per pound. Thus the advantage of cottonseed meal in supplying cheap protein is evident.

Besides composition there are other qualities of importance. Cottonseed meal that is stale, or spoiled by mould, etc. should not be fed. A fresh sample should be obtained, and a good sample in appearance presents a bright yellow color, a nutty flavor and a pleasant smell.

JUDICIOUS USE

When a farmer buys a feed in large quantity he expects to make quite general use of it, feed it in large quantities, often to the exclusion of every other feed and to all classes of stock. With cottonseed meal the pratice must be modified or it will prove a disastrous pitfall. It may be laid down as a general principle that for all feeds and all classes of stock, mixtures will invariably give best results. This is especially true of cottonseed meal. It is sometimes hard for the average man to provide a large mixture, but it should be done whenever possible and must be done with cottonseed meal to obtain results. Again the quantity must be limited and for certain stock fed very sparingly if at all. It is, therefore, not a good general purpose feed. Its chief place is with dairy cows, and for this purpose in this province it well deserves consideration.

For the man who has little succulent feed (silage and roots), therefore depending upon a dry ration, I would prefer oil cake or oil cake meal (flax seed by-product) as a source of protein, even at a somewhat higher price. For the man who makes succulent feed the basis of his ration and who has a certain amount of other grain feed (mixed grains, moulée, bran, etc.) cottonseed meal may be employed to splendid advantage for milk production. Should it be necessary to use it with the dry ration a liberal mixture of bran would be advisable, and the addition of a little feed molasses would be of special value. For average cows in full milk *three pounds* of cottonseed meal in the grain mixture would be a good allowance and the maximum amount to use, and this amount should be reached gradually. When short pastures are abundant it will again prove a splendid feed.

For steer feeding it can serve a good purpose, and will give best results under the conditions above described.

It may also be fed small quantities to horses although it does not fill an important place in this connection.

SOURCES OF DANGER

Reports of feeding cottonseed meal are not always highly complimentary to either feed or feeder. As above intimated an inferior sample is not safe to feed to any class of stock. In this connection it may be stated that damaged feed of any kind should be fed with due care, in many cases destroyed rather than fed. Cottonseed meal stores fairly well, however, and this danger can be easily avoided.

It is an extremely rich food and must always be fed in limitation. Even steers, if fed large quantities of it alone, as a grain feed, and confined, are apt to show injurious effects after a few months feeding. If fed in mixture and not in excess it is perfectly safe.

For calves and pigs it has a special danger and should not be fed. It can be fed to both by starting with a small amount and limiting the quantity very closely, but it must be labelled as decidedly unsafe for these two classes of stock. It contains a poisonous material which apparently is harmful in small quantities to pigs and calves but not to other stock. The United States Bureau of Animal Industry has identified this poison as a certain acid which is present in some quantity in all samples.

H. BARTON,

Macdonald College.

THE MARKET LAMB

Too much importance being placed on Size. —Importance of a pure-bred Sire.— More pure-bred Sheep Breeders needed.

THE ruling price for market lambs has been higher this year than for many years past, and although other classes of stock have taken a decided drop in price, at the close of the season the lamb market has remained steady throughout.

Last year the lamb market opened easy with prices gradually tightening up especially at the end of the season. This year the market opened very firm and prevailing prices were higher throughout the entire season than they ever were before. This has been due to a general scarcity of lambs and the increasing demand for lamb which has become an important factor in the daily bill of fare of the Canadian. Nothing demonstrated the fact that there is a general shortage of lamb better than this year's prices, and sheep breeders, now assured of profitable returns, are viewing the rearing of lambs with a good deal of enthusiasm; in fact many are increasing the number of ewes in their flocks, and the general outlook is extremely bright. Present prices have made the heavy lamb very popular, and those breeds of sheep that are capable of producing the heavier lambs are attaining more widespread reputation than ever before. There is, however, a tendency to overdo things in this respect. No one breed is adapted for all conditions and all soils. Sheep reared on light soils have a tendency to be lighter in the bone, shorter in the wool and shallower in the body, while on the other hand sheep raised on a gravelly clay soil of a rolling nature are heavy in the bone, coarse in the wool, with more scale and constitution. While it is true that a large sheep will usually give better results on the richer soils, yet it is equally true that on the more barren soils the same breeds would prove a failure and degenerate from breed type faster than a smaller and hardier breed. The effect of the character of the soil as a factor in controlling the size and weight of sheep and lambs has received very little consideration in this country, yet anyone who is in a position to know the weight of lambs in a certain district is free to admit that lambs in certain sections of the district are annually heavier than those of another section, perhaps only a few miles distant. Although the breeding of the sheep is the same throughout, this difference can be attributed largely to soil conditions. Again, in certain parts of the province the sheep are little better than mongrels, yet upon enquiring into their breeding it compares favourably with those of another section with much superior sheep. To all outward appearance the same methods of feeding, care and management prevail in both cases. The soil is undoubtedly the contributing factor. Old Country farmers were acquainted with the fact long ago, hence we find them limiting each breed to its own particular section of the country. There, as here, some farms are better suited to sheep-raising than others, but they have learned to select the sheep best suited for their farms. A medium-sized sheep on rather light soils will often produce a heavier lamb than an extremely large one, so that size, while important, has its limitations.

Again, in showing a partiality for the large lamb we must not overlook quality and breeding. When lambs were cheap, and especially during the last few years owing to the size of the flocks being diminished, many farmers did not consider it worth while to buy a pure bred ram, preferring rather to select a grade lamb out of the flock in the fall. Where the ewes had a good deal of pure blood in their veins and where the selection was based on quality as well as size, the flocks still contain good utility breeding ewes, but on the other hand where the ewes were of the commoner type and when the selection of the ram was not judiciously made, the flocks have deteriorated and

A GROUP OF CHEVIOTS AT MACDONALD COLLEGE.

are now producing very inferior lambs, some of them small and others large and very coarse, all being a very inferior market type. This practice has greatly reduced the breeding of our sheep generally throughout the province, and accounts in a large measure for the scarcity of pure bred flocks. Now that good prices for lambs, mutton and wool are assured, and there is a tendency to increase the number of the flocks, the importance of the pure bred ram as a getter of good wooled sheep and large, uniform, strong, blocky lambs is unquestionable. Size is all important, but with it the farmer must have constitution and the other mutton qualities which go to make a good market lamb. Higher prices give the farmer a chance to make sheep raising even more profitable by the use of the pure bred ram. More wool of a better quality, heavier lambs and the difference between the top and bottom market price are the factors which constitute the most success and largest returns from sheep raising. These in a large measure are the attributes of the pure bred ram.

While the use of the pure bred ram is advocated, yet it is all too evident that he is in the minority throughout the province. Statistics show that pure bred sheep are the exception rather than the rule. The majority of sheep-breeders who wish pure bred stock have to import it from outside sources, and in most cases it is brought by mail. This means that freight rates are higher. Such stock is likely to be more costly, of a lower standard, and may not be what the farmer requires. Moreover, a large proportion of men who would buy pure bred stock if it were close at hand prefer to do without rather than run the risk of buying by mail. Quebec to-day certainly offers splendid opportunities to men who are willing to go into the raising of pure bred sheep and supply the demands of the sheep breeders of the province. Until the province has a larger proportion of pure-bred breeders the sheep industry will not meet with the success that it merits.

These men are with us, but up to the present they have not received sufficient encouragement. Farmers as a class are rather inclined to underestimate the value of the pure bred lamb. The price of pure-breds must of necessity be higher than grades, and while for the average farmer this should be kept as low as possible yet he must be willing to come half way and be prepared to pay a sufficient price to cover the extra expense in connection with the raising of pure-bred animals.

The present market tone will do much to transform sheep conditions throughout the province, but farmers should endeavour in every way to assist favourable circumstances. Progress goes hand in hand with prosperity and decline with hard times. It takes a good many years to offset the influence of good breeding. A little extra outlay now will go a long way in improving the flock. "Strike the iron while it is hot".

A. A. MacMillan,

Macdonald College

FOOT AND MOUTH DISEASE

AFTER the recent notoriety which has been accorded Foot and Mouth Disease in the middle Western states, the naturally enquiring mind may well ask, "What is this terrible disease, and why so much disturbance wherever and whenever it appears?" In answer to the question the writer takes his pen with the hope that he may dispel a few of the illusions surrounding the malady, and perhaps reconcile to some extent the indignant stock-owner and the Sanitary Authority who acts but has no time for explanations.

Foot and Mouth Disease may be defined as an acute, febrile, infectious and highly contagious disease of the cloven-footed animals, in the course of which vesicles (blisters) develop on the skin, between the toes, and on the mucous membrane, especially of the gums and lips. The disease is also communicable to man; horses and pigs are rarely affected. The cause is a micro-organism so small that the microscope does not reveal its form; nevertheless it is a living thing, because it passes from one animal to another, and it may be killed with disinfectants or heat.

The purest sources of virus are the blisters mentioned above. An exceedingly small quantity of the fluid contained in these when injected into healthy animals will produce the disease, and as the saliva, milk, tears and other secretions are easily contaminated by the bursting of vesicles it will be understood that a single case can infect its immediate surroundings in a short time. Infection may take place from a sick animal to well ones directly or indirectly through contaminated stalls, etc. Let me quote Hutyra and Marek's work on "Pathology and Therapeutics of the Diseases of Domestic Animals" (Alexander Egar, Chicago).

> "Indirect transmission has a far greater importance in the spread of this disease. The saliva, which flows from the mouths of infected animals, and also the contents of the udder or the vesicles which develop on the feet, contaminate the food, the cribs, the drinking water, the straw, the stable floor, the pasture, the highways, the railroad cars, etc., as well as the hands and the clothes of the attendants. From such contaminations, and from the floor, the virus reaches the mucous membrane of any body opening, or with the food or drinking water it enters the mouth and stomach of the healthy animal, from which points it enters the blood circulation. The virus is accordingly disseminated in the first place by affected animals during driving, railroad transportation, stabling, by common drinking places, common pastures, and yards. In the second place, food, manure and raw animal products, especially raw hides, wool and milk may be considered as carriers of the infection. Butchers, dealers, peddlers, castrators, and other persons, first of all farm hands, and also animals which are not susceptible, coming from infected premises, may contribute to the transmission of the infection. Stock markets play an especially important part, through trading, further also changes in farm hands."

Moreover, even after recovery an animal may be a "disease carrier" for a long time.

Symptoms (in cattle) usually develop in from two to ten days after infection. First there appear the generalities of almost any fevered animal—cold extremities and chills, then diminished appetite and suppressed rumination. These symptoms, however, especially marked in young animals, may be absent altogether in mature cattle. A few days later, should the mouth be affected, as is usually the case, eating is very slow; between feeds saliva flows in strings from the lips and at each opening of the mouth a smacking sound is heard. Examination of the mouth reveals reddened gums, particularly in the front of the upper jaw. Soon small vesicles about the size of a pea form there and inside the lips: as time goes on the contained fluid, at first clear, becomes turbid. The vesicles may run together, forming quite large ones; the blisters burst, and a very tender raw spot is left. Later a scar forms. Blisters on the tongue are much larger and more deeply seated. Milk flow is said to cease almost entirely, and the animals lose weight surprisingly fast.

The feet may be affected along with or after the mouth. Around the coronet and between the toes, there is redness and tenderness, and later a development of vesicles not very different from those above described. After their bursting however, scabs form and, as healing is not fast, complications such as secondary infection with sloughing of the hoof or permanent lameness may easily result. Should the eruption develop on the udder and teats of milch cows a severe case of mastitis with probable loss of several quarters may be expected. It is easy to mistake these lesions for those of cowpox.

The course of the disease when uncomplicated lasts about two weeks, sometimes longer. When only the mouth is affected the vesicles may be healed in five or six days. When the feet are involved a longer course is the rule, and it should be borne in mind that the two parts mentioned in the name of the malady need not both be affected in any animal. Six weeks after the first case develops is supposed to see the entire herd on the road to recovery. Contrary, perhaps, to expectations, the mortality is light instead of severe; it rarely exceeds 5% and usually it is less than 1%.

In addition to the form described there is a malignant type of Foot and Mouth Disease which is much shorter and its course is almost apopletic in its symptoms, and with a mortality up to 80%.

Treatment amounts to very little, firstly because medicines have little or no effect on the course of the disease, though complications may be prevented by their use, and secondly because the Sanitary Authorities take matters into their own hands. That the disease is preventable by the exercise of rigid precautionary measures is the fundamental reason why all Governments are determined to eradicate it. And in view of its extraordinary contagiousness, its transmissibility to man, the loss it occasions, the fact that embargos are promptly placed on cattle from countries where an outbreak has occurred, thus effectively paralysing live stock exportation, and that early and determined efforts can suppress the outbreak before it assumes the proportions of an epidemic, no one can but agree that the Governments are right. For as the great Pasteur has hinted, infectious diseases will someday be wiped off the face of the earth.

A. SAVAGE, D. V. M.

Macdonald College.

THE CARE OF THE COLT

EVERY foal should be the product of intelligent, correct breeding, not hap-hazard, hit-and-miss mating.

Too many misfits and mongrels are produced. They fail to make high class horses, even when properly fed and managed. Born wrong they do not grow aright. It is also lamentably true that many colts born right are raised wrong.

Every farmer should aim to mate only suitable sires and dams for the production of ideal horses, for the various purposes, and then should feed and develop the product perfectly.

Only a pure bred sire can beget a grade horse. He also must be sound, muscular, prepotent and suitable in type if the colt is to be ideal. This is equally true of his mate. The sire does not necessarily correct, in his progeny, the serious faults of conformation of his mate. He reproduces only those of his features which are stronger or dominant over the corresponding features of the mare. She stamps as surely upon her offspring those of her undesirable traits, which are dominant over the corresponding traits of the sire. To have a colt born right, so that it will develop right, the characters of both sire and dam should be as similar and ideal as possible. Violent crosses should be avoided. The most prepotent pure bred sire should be used. The use of all other sires is mere waste of time and money.

Given a foal that is born right, its development should not be left to chance or luck. It can only materialize the hereditary possibilities of its breeding if perfectly nourished. The inadequately fed, and consequently stunted foal never attains full size or value. At least one half of the growth and weight of a horse is attained during the first twelve months of life. That is therefore the most important period in the life of a foal.

The pregnant mare should be fully fed to insure adequate nourishment of her fetus and an abundance of milk for its reception. She should be as well fed while nursing the foal.

If the foal is to make perfect growth it must, from its earliest days, be provided with oatmeal, then crushed oats and wheat bran and afterwards an abundance of whole oats, bran, grass, hay and roots. There is no time in the life of a horse when the feeding of oats and bran is so profitable. The foal that is not so fed may lack at maturity twenty-five per cent or more of the size, weight, strength and value possible through heredity. Overfeeding and pampering must be avoided, however, as they may prove injurious or ruinous.

Then, too, if care is not taken to train the foal's hoofs properly they may grow crooked and throw the leg bones out of plum. This will spoil action and utility at maturity. The feet must be made level and true by expert rasping once a month or so during the growing years. Such trimming is all-important. Postponed it soon becomes too late to help; the mischief is done.

"As the colt is, so will be the horse."

WINTER-DAIRYING

THE problem of winter-dairying is one which should receive more attention from the dairy farmer than it does at present. In the average dairy section the farmer depends upon the milk products of his cows during the summer to furnish him with a sufficient yearly revenue. Then, if pastures fail or insufficient land has been allowed for pasturing, the production falls short and a small income is the result. The effect of this is, too frequently, the reduction of the number of cows kept rather than the adoption of some other system of dairy farming that will utilize the crops and labour at hand to better advantage.

The result of adopting a system of winter-dairying is an increase in the number of cows kept and this is one of the necessary changes in many sections, where the soil would be in a better state of fertility if more live stock were fed.

The question of keeping efficient labour on the farm is one that is causing much agitation at the present time. A competent man must be paid according to his work, and if he is allowed to be idle for a part of the year there is a loss to both employer and the employed. An equal distribution of labor throughout the year allows the farmer to keep the hired help with a profit. During the summer months, the farm work of soil-cultivation, seeding and harvesting takes the greater part of the time and this makes the farmer dependent on the winter season for sufficient time to give attention to his herd.

There are other questions to be considered in making a choice between summer and winter dairying. The modern dairyman has much careful and regular work to carry into effect before success is assured. The stables and cows must be kept clean, the milking utensils must be washed and scalded regularly and the milk must receive proper attention in handling. In the modern herd, there must be time spent in keeping records and balancing accounts, from which to estimate the value of the individual animals. This work can be done best in the winter when the most time is available, and no work is more satisfying than attending to a dairy herd when it is properly done.

For winter dairying we should have the cows freshen during the months of November and December. By this time they are in winter quarters and have become accustomed to the winter diet. The bulky feeds should consist of clover hay or mixed hay, turnips or mangels, and a small feed of straw per day not more than they will eat up clean. The meal ration will vary according to the market price and the kinds available. A mixture will always give more economical returns than any single grain.

Examples of rations might be given as:

Clover or mixed hay	14 lbs
Turnips or mangels	40 lbs
Bran	3 lbs
Middlings	3 lbs
Oats	1 lb
Cotton seed meal	1 lb

or

Hay	14 lbs
Roots	40 lbs
Bran	3 lbs
Oats	2 lbs
Barley	1 lb
Linseed Meal	1 lb

Either of these rations would be sufficient for an average cow giving 30 to 35 lbs. of milk per day. If she is giving less or more than that amount, the grain could be increased or decreased accordingly. The flow of milk will be while the cows are in the stable and they will begin to lower in production during the months of March and April, but as soon as put on the grass, they will produce a second flow and will continue to do well until they are dry before freshening. When allowed to dry off on the fall pastures, the common fault is that the pastures are short and there is nothing on which the cow can gain flesh before the next lactation period. This can be overcome by feeding green crops and will keep the cow in much better form than if she is expected to produce milk and keep in good fleshing at the same time.

When summer dairying is practised the cows freshening in the spring will produce a large flow of milk as long as the grass lasts. Late in the season the dry grass, flies and heat will reduce the flow unless heavy feeding is resorted to. At this time the cow would be better if dry and thus the tax on her body tessened.

An objection that is held against winter dairying is that the cost of feed is so high that it is not economical. While this is true, to a certain limit, there are so many features that stand in favor of such a system, that it is largely overbalanced. During the early months of the winter, when an abundance of feed is to be had, the cost of production is lower than it is during the spring months when feed is high in price and the cows are lowering in milk production. Then on the grass the cost is low, but rises as the pastures become short and the heat and flies become annoying.

The prices received for the winter products of milk and the extended milk flow compensate largely for any rise in cost of production that will occur. Then the ease with which milk is handled in winter is an insurance against loss and is worthy of consideration. The question of raising the fall-born calf must not be overlooked. Calves dropped in the fall are at liberty and receive more attention from the feeder as well as the cows. Before the heat and flies of the following summer, they are matured well enough to stand the test and will keep growing, while the spring calves are not receiving proper attention on account of the summer work, or are suffering from heat and flies, unless kept in the stable. If we consider this still further we will find that the development of the calf makes the development of the cow, and while good calves can be and are raised during the summer, the feeder always feels that he is neglecting his other work and will of necessity neglect the calves that are his coming cows. In winter this pressure of time is easily avoided.

Summing up the advantages of winter dairying, we find that we have (1) economy of labor and time (2) an extended milk flow, which gives greater profits (3) the most favorable time to raise the calves, which makes a better herd, (4) the highest prices, and (5) the best season in which to handle milk and its products.

W. J. REID,
Instructor of Animal Husbandry,
P. E. Island

STUDENTS LOADING TURNIPS AT MACDONALD COLLEGE.

RECORD OF PERFORMANCE TEST

Ayrshire cows and heifers that have qualified in this test during September and October, 1914

Name of cow	Owner	Lbs. Milk	Lbs. Fat	% Fat	No. Days
Mature Class					
Dorothy—19185,	H. W. Vanderhoof, Huntingdon, B.C.	10937.	341.	312	321
Ruth—23578,	Wooddisse Bros., Rothsay, Ont.	9371.	359.	3.82	365
Four Year Old Class					
Miss Wylie—28176,	S. C. Crockett, Middle Musquodoboit, N.S.	11019.	493.	4.47	365
Dairy Queen of Orkney—38376,	Harmon MacPherson, Orkney, Ont.	9584.	367.	3.82	359
Three Year Old Class					
Minnie of Hickory Hill—32340,	N. Dyment, R.R. No. 2, Dundas, Ont.	9599.	399.	4.16	324
Gretta of Grenmount—36002,	Gillespie Bros., Ventnor, Ont.	7814.	302.	3.86	365
Lady Ayr—35360,	Gillespie Bros., Ventnor, Ont.	6960.	278.	3.98	343
Two Year Old Class					
Fairview Queen—34123,	A. McRae & Sons, Charlottetown, P.E.I.	10742.	492.	4.57	365
Milkmaid of Orkney—39834,	Harmon MacPherson, Orkney, Ont.	9812.	347.	3.54	324
Pet—32826,	Wooddisse Bros., Rothsay, Ont.	9114.	370.	4.05	365
Snowdrop of City View—38765,	Jas. Begg & Son, R.R. No. 1, St. Thomas, Ont.	7954.	339.	4.26	365
Snowflake of City View—38603,	Jas. Begg & Son.	7550.	347.	4.59	365
Nellie of Spring Brook Farm—55377,	A. McRae & Sons, Charlottetown, P.E.I.	7261.	323.	4.44	352
Lakeside Caprice—32707,	Geo. H. Montgomery, Philipsburg, Que.	6958.	281.	4.04	343

Readers will note the large records, especially of several in the two-year-old class, also note the high average per cent of butter fat.

W. F. STEPHEN,

Secretary-Treasurer,

Canadian Ayrshire Breeders' Association
Huntingdon, Que.,

October 31st, 1914.

THE DAIRY

DAIRY SCHOOL

St. Hyacinthe

WINTER COURSE 1914-15.

1914.

1st Course (English) . 1st to 22nd December.

1915.

2nd Course, Inspectorship Candidates, January 11th to Feb. 4th.

3rd Course, Butter & Cheese makers, February 8th to March 4th.

4th Course, Butter & Cheese makers, March 8th to 31st.

For full information apply to:—

O. E. DALAIRE,
Director,
St-Hyacinthe, P. Q.

REPORT OF THE DAIRY COMMISSIONER

THE Report of the Dairy and Cold Storage Commissioner for the fiscal year ending March 31st, 1914, has just been issued.

This report deals with the progress of dairying, the expanding home market, the export trade, the importation of New Zealand butter and the work of the Finch and Brome Dairy stations, of the Extension of Markets Division, of the Fruit Division and of the Division of Cold Storage.

In the appendices, of which there are eight, the reports of the chiefs of the various divisions are given; these include many details illustrative not only of their work but of the progress being made in dairying, marketing, storing and shipping of fruit.

This report, which is issued as Sessional Paper No. 15a, is a volume of 112 pages. Copies are available upon application to the Publications Branch, Department of Agriculture, Ottawa.

OFFICIAL RECORDS OF HOLSTEIN-FRIESIAN COWS

From October 1st to October 31st, 1914

Number and Name of Cow	AGE y.	m.	d	Milk Lbs.	Fat Lbs.	Butter Lbs. 80% Fat	OWNER
MATURE CLASS							
1. Aaggie Faforit Johanna 9657	7	1	20	652.9	20.83	26.03	
Fourteen day record	7	1	20	1286.5	40.89	51.11	A. Sherrick, Ringwood, Ont.
2. Ethel Carneira 3rd 8483	7	0	12	403.6	15.23	20.[illegible]8	Jos. H. Laycock, Okotoks, Alta
SENIOR THREE YEAR OLD CLASS							
1. Lady Paladin 24359	3	9	12	436.6	17.27	21.59	Peter Smith, Stratford, Ont.
2. Plus Hengerveld Keyes 17620 .	3	6	10	349.9	14.63	18.29	A. D. Foster, Bloomfield, Ont.
JUNIOR TWO YEAR OLD CLASS							
1. Helena Keyes Posch 21376 .. .	2	4	16	327.8	14.20	17.75	A. D. Foster, Bloomfield, Ont.
2. Helena Sylvia Posch 21373 .. .	2	5	26	374.9	13.27	16.59	A. D. Foster, Bloomfield, Ont.
3. Helena Beets Posch 21372 .. .	2	5	13	357.0	12.06	15.07	A. D. Foster, Bloomfield, Ont.
4. Ida Abbekerk 4th 24362	2	2	6	365.1	11.24	14.05	Peter Smith, Stratford, Ont.
5. Roxie Clay 24910	2	5	1	280.7	8.94	11.17	A. Sherrick, Ringwood, Ont.

Reports of the official tests of nine cows and heifers were received and accepted for entry in the Record of Merit during the month of October. No sensational records were made, the best being that of Aaggie Faforit Johanna, leader of the Mature class with 26.03 lbs. butter. Lady Paladin is first in the Senior three-year-old class with 21.59 lbs. butter and Helena Keyes Posch leads the Junior two year olds with 17.75 lbs. butter.

W. A. CLEMONS, Secretary.

SEMI-OFFICIAL RECORDS OF HOLSTEIN - FRIESIAN COWS

From October 1st to October 31st, 1914

Number and Name of Cow	AGE Yrs.	Days	Milk Lbs.	Fat Lbs.	Butter Lbs. 80% Fat	OWNER
MATURE CLASS						
1. Lucy Pietertje Pauline DeKol 9695	5	119	20167	686	857.5	Arch. Parks, Napanee, Ont.
2. Lady Elinora 5456	9		14631	468	585.	R. B. Brock, Jarvis, Ont.
3. Pontiac View 8343	6		12364	459	573.75	R. M. Holtby, Manchester, Ont.
4. Jewel Noah Posch 10433	5	112	11212	370	462.5	R. B. Brock, Jarvis, Ont.
THREE YEAR OLD CLASS.						
1. Annie Mercena 15928	3	103	9016	301	376.25	R. B. Brock, Jarvis, Ont.
TWO YEAR OLD CLASS						
1. Daisy Posch Princess 20594	1	354	11735	393	491.25	W. A. Paterson, Agincourt, Ont.
2. Edith Ormsby Mercena 18176 ..	2	135	9208	315	393.75	Adam Knox, Bright, Ont.
3. Lady Mable Wayne 19679	2	19	9276	312	390.	F. J. Bishop, Duncan's Station, B. C.
4. Pauline Faforit 19998	2	74	9937	303	378.75	Elmer E. Atkinson, Edgely, Ont.
5. Jewel Mercena Schuiling 19491 .	2	29	8993	297	371.25	R. B. Brock, Jarvis, Ont.
6. Rhoda DeKol Beets 17440	2	152	8786	290	362.5	Dir. Experm'l Farms, Lacombe, Alta.

The semi-official records of eleven cows and heifers were accepted for entry in the Record of Performance during October. Lucy Pietertje Pauline DeKol in the mature class adds another to our list of 20,000 lb. cows with 20167 lbs. milk and 857.5 lbs. butter. Annie Mercena with 376.25 lbs. butter is the only three-year-old and Daisy Posch Princess is highest two-year-old with 491.25 lbs. butter.

Superintendent Scott of the Provincial Demonstration Farm at Vermilion, Alta., reports that the farm herd of grade and pure bred Holsteins averaged last year 10157 lbs. milk. Dairymen in that district are naturally much impressed with the merits of the breed.

W. A. CLEMONS, Secretary.

HOW FEEDS AFFECT THE KEEPING QUALITY OF MILK

IT has been generally accepted that there is a close connection between the feed given to the cows and the quality of their milk. Cows fed on the refuse of beet-factories, turnips, sour silage etc. produce milk which shows very poor keeping quality and on analysis is found to be teeming with the particular bacteria which are present in large numbers on the feed stuffs given them. In consequence the belief has established itself that such bacteria enter the animal with the food and leave the body again in the milk. This supposition, however, does not accord with the facts. The cow's udder is not a means of freeing the body of injurious bacteria or other materials, and milk of cows fed on decayed turnips, rotten beets, etc., is just as free of injurious bacteria as the milk of the most sanitary animal at the moment the milk is secreted. However, the above-mentioned food products have an indirect influence on the milk. Such food causes considerable disturbances in the intestinal tract of the animals, and as a result the faeces or manure is almost liquid. Drops of this liquid splash over the flanks of the animals and through the stable. These small drops, which are simply teeming with bacteria, dry up quickly and the fine bacterial dust falls into the milk. In this manner the milk of cows which receive the ordinary treatment becomes badly contaminated, and in the case of neglected cows the results are startling. One example will be sufficient. In a certain stable the cows had been fed the ordinary rations and the faeces which was fairly solid gave 100 million bacteria per half-teaspoonful on analysis, whilst the milk contained 15,000 bacteria per half teaspoonful, 1% of which were colon bacilli. The colon bacillus is the principal enemy of the milk producer. Samples taken of the stable air showed that 1500 bacteria fell per minute in the milking pail from the air and 10,000 bacteria from the flank and the udder of the cow.

The rations were then changed and large quantities of slightly decayed beets and turnips were fed. Soon afterwards the faeces became more liquid and after 8 days the semi-liquid faeces was analysed. In this faeces was counted 12,000 million bacteria per half-teaspoonful, mostly colon bacilli. One small speck found on the cow's flank was examined and produced 150 million colon bacilli. The milk showed the following changes:—

Average.	15,000	bacteria.	150	colon bacilli.
3 days later.	37,000	"	9,000	" "
7 " "	70,000	"	45,000	" "
10 " "	75,000	"	58,000	" "

Such figures speak for themselves. The milk of these animals was hardly fit for human consumption, and certainly useless for the manufacture of cheese. However, a farmer can improve conditions by giving more care to his animals. He will then be able to deliver milk of good keeping quality.

J. VANDERLECK.

BUTTER MAKING AND ITS DEVELOPMENT IN EASTERN ONTARIO

L. A. Zufelt, Superintendent, Kingston Dairy School

(An address before the Eastern Ontario Dairymens' Association, 1914)

THE butter industry has seen many changes which have had far reaching results on the entire dairy industry of the Province, and we are again entering into one of these periodical changes which bids fair to rival in importance any of those experienced in previous years. Usually we have had timely warning of the approaching change, but in the present case events have crowded each other so rapidly that the majority of us have been more or less unprepared, and unless the situation is carefully handled we may not reap the advantage we otherwise should.

It is not my intention to canvass the whole situation but to touch only on such parts as I feel affect us most vitally, and possibly point out a line of action which will have the most beneficial results.

The demand of our local butter markets has increased to such an extent that we no longer have butter to export, but on the other hand our imports of this commodity are increasing rapidly year by year to supply this increased demand. It is doubtful if we fully realize just what effect this importation of foreign butter is going to have on our local producers, and it is well to look into this phase of the situation more closely. So long as we were exporters, only a small percentage of our output of butter came into competition with foreign makes. Now, however, our entire production will be placed side by side with these foreign imports, and I am afraid will suffer by comparison, and our success in holding our own local market will depend altogether on our ability to make not only as good, but a superior quality. Unfortunately, in the past we have not always held the most enviable position in regard to the quality of our butter. This was partially, if not altogether, overcome when our whole-milk creameries entered the field, but since the gradual extinction of these we are again face to face with the proposition of winning out, or at least holding our own against most aggressive foes, with the added handicap of an inferior raw material; with this distinction, however, that whereas formerly we were competitors in a foreign market with our best production we will now be fighting for possession of our own local markets, where all our grades, good, bad and indifferent, will be in constant competition with the best of the foreign makes. It is quite evident that much of our butter will not command the highest price and will gradually grow in disfavor unless we put forth every effort to maintain a standard, if not better, at least equal to the best of the foreign imports.

We all must recognize that the quality of the raw material largely influences the quality of the finished product and it is doubtful if the general average quality of the cream as delivered at our creameries has increased much during the past few years. Now, I do not wish to be misunderstood in regard to this point, nor do I wish to appear as casting reflection on those in charge of the instruction work, but we must face the fact that our butter has not advanced in reputation side by side with our cheese and for this fact we must find the cause before we can apply a remedy. I believe if we just stop long enough to examine carefully the conditions prevailing at the present time, it will not take us long to come to the conclusion that the trouble is largely an economic one. I believe, and I feel sure every creamery-man will agree with me, that the farmers supplying cream to the creameries are handling their cream more intelligently and taking better care of it today than they did some years ago. I also believe that our butter-makers have more knowledge and are using more skill in the manufacture of the butter than they did formerly; yet, we are faced with the fact that the quality is not keeping pace with these improved conditions. Now there must be a "missing link" somewhere in this chain, and I think we need not go very far before finding it. When cream-gathering creameries were first being operated the cream was expected to be delivered at least three times per week. As we all know, costs of labor, material, etc., have increased rapidly and our creamery managers in unison with all other manufacturers, in endeavoring to lessen as much as possible the cost of manufacture, came to the conclusion that this cost could be materially lowered by hauling the cream less frequently, and we find that whereas the cream was hauled three times a week a few years ago it is now being hauled only twice, and in many cases only once, per week. There can be no doubt that the good accomplished by the educational work of our instructors towards a better cream supply has been largely nullified by this practice of lessening the number of deliveries per week to the creamery, and instead of this educational work having a beneficial effect on the quality of the butter, it has been made use of to lessen somewhat the cost of haulage, and the cream as a consequence has not been delivered at the creamery in any better condition than formerly. In short, it is a clear case of a sacrifice of quality for a doubtful saving in cost of manufacture. I feel that I cannot too strongly condemn this practice, which is perhaps the most prevalent one in all lines of dairy production. We are too prone to effect a small visible saving at the expense of a much larger loss in quality.

Perhaps, after all, the chief blame for this practice does not lie with the producers but with the conditions with which they have to contend. Let us examine closely some of these conditions and see what we find. Our efforts as educators have been largely directed towards raising the general average quality of our milk and cream supply, but what reward have we to offer the individual producer when he has succeeded in furnishing a high-grade raw material. Does he as an individual receive any more for it than his neighbor who supplies an inferior article? It is true he helps raise the general average quality and indirectly shares this benefit with his neighbors, but does he receive the full reward for his individual labor? This is evidently the crux of the whole question. In proof I might point to the rapid strides made by some of our sister Provinces in raising the standard of quality of their butter from the lowest to the very highest in the Dominion by the simple expedient of a system of cream-grading at the creameries. This system, I am informed, is to be further extended by applying it to the butter which in future will be graded as well, and sold strictly on its merits. The advantage of this method is that the individual reaps the full benefit of his labor or is made to suffer for his carelessness. The careless producer or manufacturer can no longer "pool" his interests with his more progressive neighbor, nor shift his personal responsibilities to the shoulders of others. It is quite evident that if Ontario wishes to occupy the position which should rightly be hers she cannot do better than copy the example set by these younger sister provinces. I am thoroughly convinced that no method which we can employ will produce results as quickly and effectively as this system, which allows those engaged in the industry the privilege of profiting by their own individual labor. Our defect is not in a lack of education or of knowing how to produce a high grade product, but rather in a system which offers no reward to the individual for individual merit.

On account of the brisk demand at the present for butter and cream there is a tendency among many of our cheese factory patrons to change their allegiance to the creamery industry, and to these I would utter a word of caution. There is always a tendency, when new fields or channels of trade open up, to rush in headlong without any preparation, only to find that instead of making a success the venture often turns out a failure. There is room for only a few new creameries in Eastern Ontario, and these will be situated in the larger towns having good railway connection and where a local market may be obtained for the by-products. The bulk of the creamery butter of the near future will be manufactured in a few large centrally located creameries, equipped for the manufacture of butter and ice cream, as well as catering to the sweet cream trade. The small creamery, if it exists at all, will be found in the outlying districts and where the large creamery cannot enter into competition. Just what effect this will have on the industry it is hard to say, but it is evident there are elements of danger to be encountered in this new situation and I would caution those about to enter this field to go slowly.

Another difficulty to be overcome is the lack of sufficient skilled butter-makers to take charge of this rapidly expanding industry, and for a few years we may expect more or less disappointing results until a sufficient number of our young men fit themselves for these responsible positions. Butter-making looks easy to those on the outside, but the experienced man knows there are many pitfalls and difficulties in the way which require experience as well as a thorough grounding in the science of butter-making to overcome.

In recapitulation I would emphasize the following points as an aid in improving the quality of our butter:

First, employ as butter-makers only those who have the necessary qualifications.

Second, introduce a system of grading cream at the creameries whereby the individual producer will receive a just reward for his industry.

Third, to supplement the foregoing by some method that will insure the butter being sold on its merits.

POULTRY

CAPON PRODUCTION

AMONG the various classes of dressed poultry the capon is becoming more popular. It posses a quality of flesh superior to other forms of dressed chickens and thus commands a higher price. In addition it usually develops a larger frame than cockerels, though in capon production the cost of feeding must be taken into consideration.

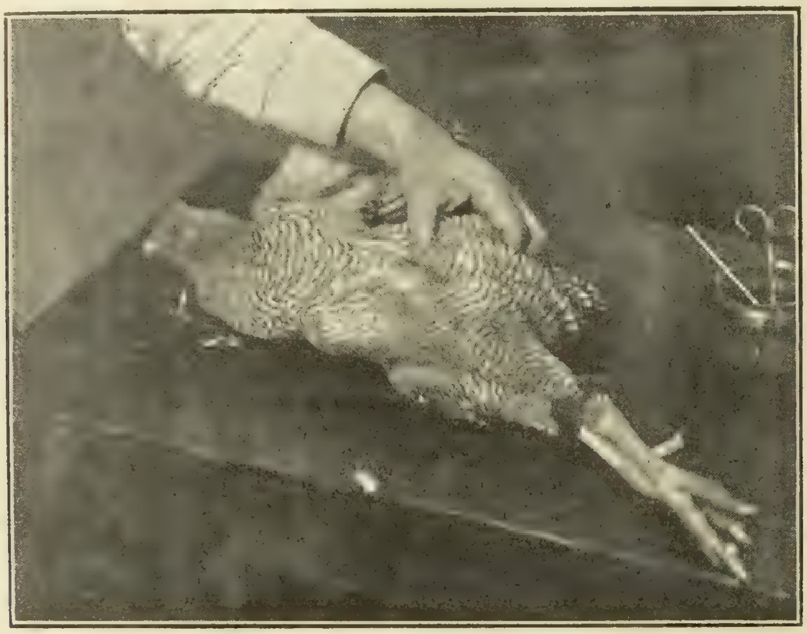


Fig. 1.—Showing copon placed on the caponizing table ready for the operation. The feathrs are removed where the incision is to be made.

A capon is a castrated male chicken. The chief object in caponising is to promote flesh formation and improved quality. After caponising the chicken becomes less active and the hackle and saddle feathers grow much longer than in cokerels. Ordinarily a two pound Plymouth Rock or Rhode Island Red is about the right size at which weight they should be about ten or twelve weeks old. At this age they are just beginning to crow. The best time to caponise will depend upon the market requirements. In Quebec and particularly on the Montreal market capons command the highest prices between Christmas and Easter, so that late chickens are preferable for caponising than early ones. A top of a barrel or a special table may be used and a set of caponising instruments is necessary. The bird is held firmly by straps and it is placed in such a position that the operation may be performed with ease. The operation should be done on bright days only, as good light is necessary. The birds should be starved for 36 hours previously in order that the intestines may be entirele empty. This makes it much easier to locate the testicles, which are situated along the back bone. When the bird is in proper position the thigh muscle is pushed back and a cut is made through the skin between the last two ribs. Then by the use of the instruments the cut is kept open while the testicle on that side is located and extracted. Care should be exercised in making the cut and in piercing the membrane immediately above the intestines. Considerable experience is necessary to insure always the complete removal of the testicle without bleeding. The lungs, kidneys or intestines should not be injured and if there is much bleeding the wound should be wiped with absorbent cotton. When one testicle is removed the bird is turned over and the operation is repeated for the other testicle.

With experience the operation becomes simple, and practically no losses result. After the operation the capons should be kept quiet for a few hours and be fed on soft food. If any air sacks form around the legs they should be picked open and the air should be pressed out. After a short time the birds are ready for heavy feeding and they should be forced until marketed.

The Montreal market offers a good price for capons at certain seasons of the year, and under certain conditions the production of capons is a profitable business.

M. A. JULL.

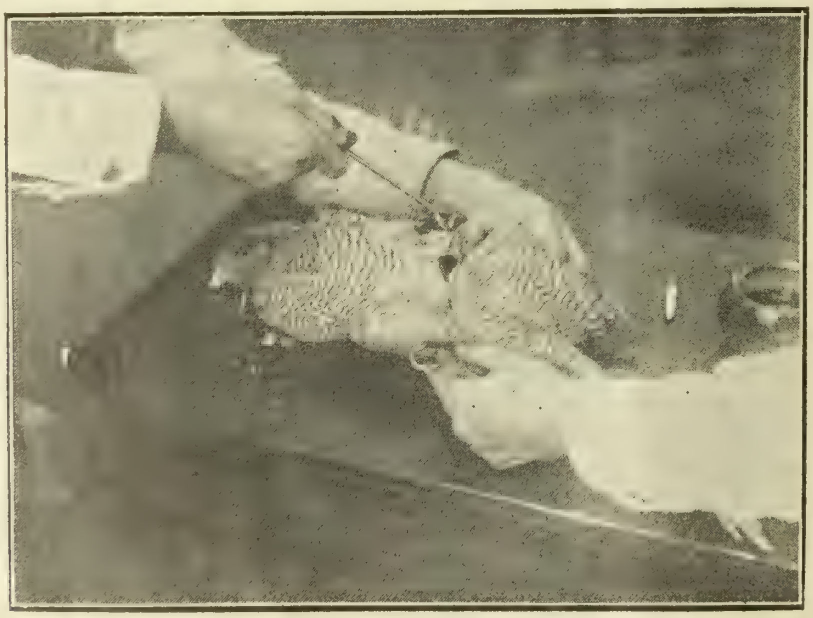


Fig. 2.—Showing the end of the operation.

NOODLED GEESE

A new method of preparing geese for market consists in fattening them on noodles. The noodles are made from a mixture of corn meal, low grade flour, barley meal and oatmeal. The mixture is moistened, with water or sour milk, and made into a stiff batter and it is then run through a sausage machine. The long strips of batter are cut into links two or three inches long, and these are called noodles. They are rolled in a good grade of flour, having the ends rounded, after which they are boiled in a wire basket supported in a boiler. When they rise to the top they are immediately dipped into cold water which keeps them separate, thus allowing them to be handled with ease. When feeding time comes the noodles are softened in warm water and the geese are stuffed. During the fattening period, which usually lasts from two to three weeks, the geese are kept in confinement.

The practice of stuffing is simple; the geese are driven into a small space with partitions on three sides and the feeder sits on a stool near the geese. He grabs each goose and holding it between his knees stuffs the noodles down its throat until the gullet is filled to within two inches of the throat. The goose is then allowed to take a drink. During the first week or so the geese are fed four times a day and afterwards they are fed every three hours night and day. A goose should never be noodled until all of the noodles from the previous feeding have been digested.

The birds increase enormously in weight, and the livers become greatly enlarged, forming the famous "paté de foi gras."

M. A. J.

THE OUTLOOK

THE existing unprecedented conditions in our agricultural industry which have resulted from the devastating war will call for the most careful attention on the part of farmers. Already our agriculture has been affected. It means increased profits to many producers while to others it means loss.

The outlook for the producers of poultry products is good, though no one should be too optimistic. Many reports and statements have appeared which would lead farmers and poultrymen to believe that greater prosperity is to be enjoyed. Such may not be the case, however. It is true that Great Britain is buying Canadian eggs and doubtless she will also import dressed poultry in large quantities. Canada has made one shipment of eggs and others may follow. Exporting at this time, however, does not mean larger profits to producers.

Canada's egg trade is limited. In fact for the past few years Canada has imported large quantities of eggs from the United States, since our own available supply was too short to meet the demands. Consequently it is rather difficult to understand why any exportation will relieve the market, for if we export we must naturally import in larger quantities to maintain a stable market.

WOMAN'S WORLD

A MOTHER'S DUTY TO HER CHILD

HOW many mothers of to-day ever stop to ask themselves "Am I doing my duty to the children God has given me?" I am sorry to say there are very few. Now, Mothers, just stop and think a moment—is the feeding and clothing of the children the only thing required? Not by any means, though they are a very important part, for to be able to think and act intelligently they must be healthy and well developed in mind and body. There is the small child which we must teach to be observant. For a time the proud mother will put before the tiny infant some bright toy or flower to attract its attention, and see it smile; but why does she not continue to put before the growing child new objects and thoughts? No, the mother must not think that just so soon as a child is able to walk it can see and think for itself. She must continue to draw the child's attention to the beautiful things of Nature and talk to it until it can see and thoroughly understand for itself. Then, too, when a child asks a question, as children so often do—for baby thinks its Mother a wonderful book of knowledge—do not put him off with an "Oh, don't bother me," "I don't know," etc. Take the time to answer the question and explain it thoroughly, and in years to come the man will look back and say "Oh, my mother told me that years ago, when I was a child, and I never forgot it".

So much for the child, but what of the young man and woman? Does the Mother keep pace with them? Too often she does not, and as a consequence the mother gets further and further away until at last they cease to ask her opinion at all. Mothers, keep your boys' and girls' confidence; show them you are interested in their joys and sorrows, and ready to share such with them, for the boys and girls have their own troubles, and if they talk them over with their Mother and get her advice they are saved a great deal of worry and set once more on the right path. Strive to make the home as pleasant and attractive as possible. Invite young people in, particularly those who have not their own home, and thus encourage your own young people to stay at home rather than go elsewhere to mingle with undesirable company.

Let us put forth every effort to keep the boys and girls at home. Provide them with good literature and music, and thus build up nobler and better men and women for our country's future welfare.

A. H.
Pontiac Co.

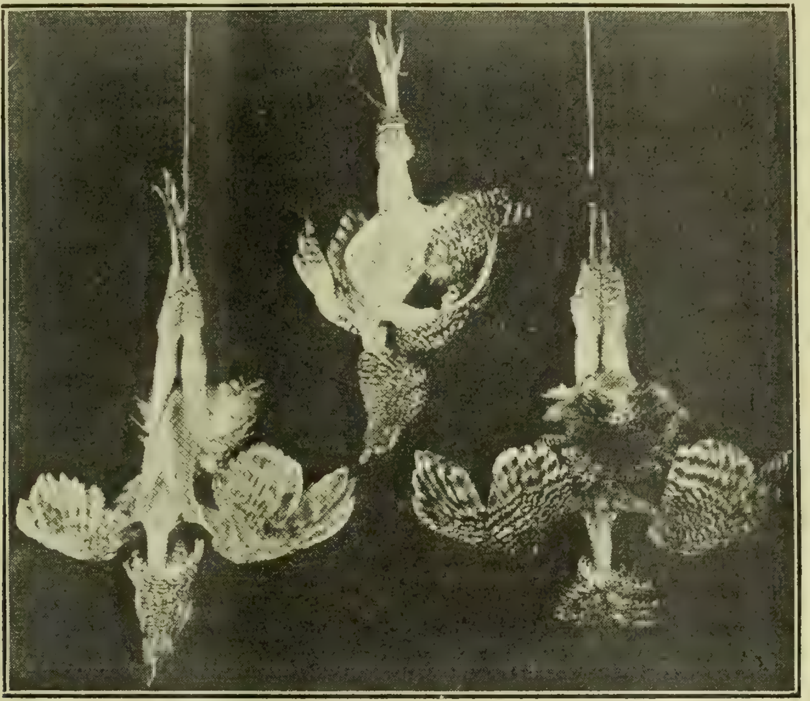


Fig. 3.—Showing well-fattened capons properly finished and dressed for market.

Otherwise, if we export, we must give up eating eggs in considerable quantities. These new conditions brought about by the war may mean slightly advanced prices in local cases, though it is difficult to see how greatly increased profits will result in general. We must not be too optimistic.

Also, the profits of many poultrymen who purchase all of their poultry foods will be affected. With us, grain is approximately 20% higher in price than under normal conditions and a prominent grain dealer has just informed me that the wheat market is expected to advance somewhat. The price of eggs is about the same as under normal conditions, or at any rate the price of eggs has not advanced in keeping with the price of poultry foods. It would be rather difficult for the farmers to get together to force the price of eggs up as dealers have done with various commodities, sugar included.

It might be well to look at the subject from a different standpoint. What does this condition need? It needs what Great Britain needs and in this particular case it is eggs. Eggs are one of the most staple food products and if we as producers can do anything through increased egg production to supply the needs of our country then we shall do something worth while. We must produce as we have never produced before.

M. A. JULL.

FATTENING DUCKS

MATURE ducks are easily fattened in confinement. They require heavy feeding for about three weeks on fairly strong rations. One good ration consists of: corn meal 3 parts by weight, low-grade flour or middlings 1 part, beef scrap $\frac{3}{4}$ part, and green food 1 part. This is fed three times a day for the three weeks with the result of increase in weight as well as improved quality. The beef scrap and green food are important as they have a great influence on proper gain to weight. The actual length of the feeding period must be determined by the condition of the birds. When properly fattened the flesh is of excellent flavor.

M. A. J.

DRESSING DUCKS AND GEESE

THERE are two methods of plucking ducks and geese, one is by steaming and the other is by "rosining".

In steaming, the birds are bled by cutting the jugular vein, the wing and tail feathers are plucked and then the bird is steamed. Care should be exercised to have dry hot steam. Any condensation will tend to partially cook the flesh and will give an unsightly appearance. If possible the bird should be hung by the head or neck while steaming, which takes about two minutes.

The rosining method consists in sticking the bird to loosen the feathers, and then plucking dry. Then powdered rosin is rubbed into the down and remaining feathers and the bird is scalded; this loosens the feathers and makes them easy to remove.

Of the two methods, steaming is preferred since the birds are turned out equally well and more feathers are saved, while less time in dressing is required.

M. A. J.

FOODS AND FOOD PREPARATION

Lesson XI

PROTEIN OR NITROGENOUS FOODS.—EGGS

IN our first lesson we spoke of Protein, the only Food Principle which contained the element *nitrogen* and, therefore, the only one which could build up and repair the tissues of the body. The Proteins may be divided into two classes:

1. True Proteins—those which alone can build up and repair the tissues of the body.
    a. Albumin. Found in milk, eggs and meat.
    b. Casein. " " milk and cheese.
    c. Gluten. " " wheat.
    d. Legumin. " " peas, beans and lentils
    e. Fibrin. " " blood.
    f. Vitellin. " " egg yolk.

    In addition to the proteins foods contain some nitrogenous substances not capable of building up or repairing tissue. E. g. Extractives of meat.
3. Non-Proteins—those not capable of building up or repairing tissue. E. g. Extractives of meat.

Effect of Heat

In cooking the protein foods, remember — *Proteins are coagulated by heat, and high heat hardens proteins.*

Since Albumin, found nearly pure in the white of egg, is one of the most important of the proteins, and also the one which requires the most care in cooking in order to make it easily digested, we shall begin with a lesson on eggs.

Since the purpose of an egg is to develop a chick, we shall expect to find in it all the building material necessary for the purpose, along with such a supply of nutriment as the chick requires until it is ready to be hatched. There must be protein for building the tissues of the body, mineral matter, especially salts of lime, phosphoric acid and iron, for the making of blood and bone, and a supply of fat, for that is the most compact form in which food for the young chick can be stored. The following table shows the proportions of each principle in the yolk and white:—

	Water	*Protein*	*Fat*	*Mineral Matter.*
White	85	12.6	25	.59
Yolk	50.9	16.2	32	1.09

The white is chiefly valuable as a source of protein. It consists of a solution of protein. The yolk is rich in fat, iron, lime and phosphorus. It is a useful food for the anaemic and very valuable for young children, especially those suffering from rickets.

Nutritive Value

Eggs contain almost the same total nutritive value as beef but they are relatively richer in fat and poorer in protein. For this reason, they are well adapted to supplement a food rich in carbohydrate, moderately rich in protein, but poor in fat. E. g. rice and other cereals, bread, starchy vegetables and the addition of eggs to these in the form of puddings make a complete dish.

Digestibility

Eggs, if properly cooked, are easily digested and very thoroughly absorbed in the intestine. They contain sulphur and, unless digested before decomposition occurs in the food tract, give rise to hydrogen sulphide gas. They should not be eaten by those suffering from any severe gastric derangement. The digestibility of an egg depends largely upon its freshness and the manner in which it is cooked. Carelessness in cooking and serving may make an egg hard to digest and unappetizing, when, if properly cooked, it would be more palatable and easy of digestion. A raw egg on account of its blandness does not stimulate the flow of the gastric juice and is not as easily digested as a soft cooked egg, but if the raw egg is heated, the albumen is finely divided and is more quickly acted upon by the gastric juice.

A soft cooked egg is digested very quickly. A medium cooked egg is not so easily digested as either raw, soft, or hard cooked, and certainly should not be served in this manner to the sick.

A hard cooked egg, if *boiled*, is hard to digest, but cooked as below and chopped very fine, will digest as quickly as a soft cooked egg.

Care of Eggs

The shell of an egg is porous and should not be allowed to lie in an unclean nest or be washed in other than clean water.

Preservation

Select perfectly fresh, unwashed eggs. May and September eggs are best. Buy pure water-glass and mix it with ten times its weight in water. Use water which has been boiled and cooled. Keep the receptacle covered and in a cool place (not higher than 55° F.) Never use the same water-glass twice. Remove eggs to be used only once a week.

COOKING

1. *Eggs Cooked in the Shell*

Have the water boiling in a saucepan. Put in eggs and *cover closely*. Remove the pan to part of the stove cool enough to touch with the hand. Let the eggs stand seven minutes. (The material of which the cooking utensil is made will make a difference in the time. When using aluminium, nickel or copper utensils, 4 minutes is sufficient.) The point to be remembered is that eggs should *not be boiled*, as high heat hardens proteins, and renders it less digestible. Notice the difference between the white of an egg which has been boiled and one cooked as above. In the former case the white is hard, in the second it is soft and jelly like.

2. *Poached Eggs*

Have the water boiling in the frying pan. For every cup of water add ½ teasp. salt. Place the pan on a part of the stove where the water will not boil and slip in the egg from a saucer. When the egg is cooked, remove with an egg lifter to a hot plate, with a piece of hot buttered toast.

3. *Scrambled Eggs*

2 eggs.
¼ c. milk.
1 tblsp. butter.
¼ teasp. salt.
A little pepper.

Beat the eggs until the yolks and whites are well mixed. Add the seasonings and milk. Heat the omelet pan. Melt the butter in it and turn in the egg mixture. Cook slowly, scraping the mixture from the bottom of the pan as it cooks. As soon as a jelly-like consistency is formed, remove at once to a *hot* plate or buttered toast.

4. *Fried Eggs*

Heat sufficient fat (bacon or butter) to cover the eggs. As soon as the fat is hot, place pan on the back of range or over a very low flame. Drop in the eggs and if not covered with fat baste the fat over them. Remove as soon as egg white is white and jelly-like. Serve on strips of bacon or rounds of toast.

5. *Hard Cooked Eggs*

Follow directions for egg cooked in the shell, leaving the egg in the water for 45 minutes. If eggs are to be used for salads, garnishes etc. remove shells and when cool set in refrigerator.

6. *Egg Salad I*

Have ready firmly cooked eggs. When cold slice or cut in pieces over a bed of crisp clean dry lettuce. Serve in salad bowl having dressing in separate dish.

7. *Egg Salad II*

Have ready cold firmly cooked eggs. Cut them crosswise and remove yolks. Press yolk through a sieve, season with salt, pepper and a little butter, or mix salad dressing with the yolk. Fill in the cavities with the mixture and serve separately and in salad bowl, using lettuce as a garnish.

8. *Egg Filling for Sandwiches*

1 firmly cooked egg.
¼ teasp. salt.
⅛ teasp. mustard.
1 teasp. butter.
Few drops vinegar.
Few grains cayenne.

Mince egg finely. Add seasonings and butter. Mix well. Salad dressing may be used instead.

OMELETS

General Method of Making an Omelet

Separate the eggs, beat the yolks until thick and lemon coloured, add salt, pepper, liquid and any solid ingredients which may or may not be used. Beat whites until stiff and dry, and *cut and fold* whites into your mixture, until the liquid has been taken up. Heat omelet pan, buttering sides and bottom. Turn in mixture, spreading evenly, and place on range where it will cook slowly until the bottom is delicately browned. Then place pan in oven until the top is "set". If it clings to the finger it needs longer cooking. Grease and fold omelet and remove to hot plate or platter. Garnish with parsley.

Note:—Chopped chicken, minced parsley, grated cheese, or minced ham, may be sprinkled over the omelet before folding.

1. *Foamy Omelet*

4 eggs.
½ teasp. salt.
4 tblsp. hot water.
1 tblsp. butter.
Few grains pepper.

2. *Spanish Omelet*

Make a foamy omelet as above. Serve on hot platter or serving plate. Garnish with parsley. Serve in separate dish the following tomato sauce.

1 cup tomatoes.
1 tblsp. butter.
A small piece of chopped red or green pepper or chopped pimento.
Celery Salt.
2 or 3 chopped mushrooms if desired.
½ tblsp. flour.
1 teasp. chopped onion.
Salt and pepper to season.

3. *Bread Omelet*

1 egg.
2 tblsp. milk.
2 tblsp. bread crumbs.
Salt, pepper and butter sufficient for pan.

4. *Orange Omelet*

1 egg.
1 tblsp. orange juice.
Few drops lemon juice.
1 teasp. powdered sugar.
½ orange.

Divide half the orange in sections. Remove the skin and seeds. Cut in pieces and spread over omelet before folding or leave sections whole and garnish omelet. Some of the cut orange may be mixed with the egg yolk. Fold and sprinkle with powdered sugar.

5. *Jelly Omelet*

Make an orange omelet, omitting oranges and lemon. Spread with jelly before folding. Sprinkle with powdered sugar after folding.

F. CAMPBELL,

Demonstrator to Homemakers' Clubs.

THE CHILDREN'S HOMER

Part II

The Adventures of Odysseus—I

It was a long, long time after Odysseus left Troy, before he was allowed to reach Ithaca, his island home. This was because he had so angered Poseidon, god of the sea, that he would not suffer Odysseus to cross his domain in safety.

Athena, the goddess of wisdom, dearly loved Odysseus, because he was so clever and quick-witted, and because he never forgot to offer sacrifice and worship to her. So, at a council of the gods, when Poseidon was far away at the other side of the world, Athena begged Zeus to have pity on Odysseus and his wife and son, who had suffered so long.

Zeus agreed to permit Odysseus to reach home safely, and told Athena she might go do Ithaca, and rouse Telemachos, Odysseus's son, to go in search of his father.

It was a sad state of affairs that Athena found when she came to Ithaca. She took the form of an old friend of Odysseus, Mentor, and, coming to the palace as a guest, was courteously received by the young prince, Telemachos. But the queen, Penelope, was beset by many suitors, who declared that Odysseus was surely long since dead, and Penelope must choose one of them for her husband. This, Penelope, believing that Odysseus would still come home, could not bring herself to do; but the suitors would take no refusal, and loitered about, feasting in the palace, and amusing themselves at the expense of Odysseus, as they would not have dared to do for a minute, if he had been at home.

How it angered Penelope and Telemachos! But they dared not show it, for fear of the suitors. And this was what Athena found when she came. Telemachos, pleased to see a friend of his father, told him frankly how unhappy and how helpless he was. Then, Athena, in the form of Mentor, urged Telemachos to speak out boldly to the suitors, to say to them that Penelope would go back to her father, and that they should go thither to woo her, as was fitting. If they would not, then Telemachos ought at once to go seek for his father.

OF GENERAL INTEREST

TWO CHRISTMAS POEMS

(Copyright, The Frank A. Munsey Co.)

TWINE THE HOLLY

Twine the holly—wreathe the bay!
While droops the mystic mistletoe
From arch and ceiling, high and low,
Where merry-hearted maidens trip,
Bright of eye and red of lip.
Twine the holly—wreathe the bay,
For 'tis coming—Christmas Day!

Fill the stocking—deck the tree!
The welkin now resounds with cheer;
Christmas comes but once a year.
Sing with gladness old and young,
Praises sing with heart and tongue!
Christ is born! Bend ye the knee!
Ring ye bells! Ring joyfully!

Sarah Martyn Wright

TWO CHRISTMAS MORNINGS

My baby, on this day, long, long ago,
A little Child first opened wide His eyes
Upon the world—not knowing then the wo
He came to ease, but just the faint surprise
Of babyhood at feeling life's first glow;
And He was Mary's, as you're my heart's prize.
And this my longing soul's great wish for you:
That love like His may bide within your heart;
That though the world-temptations shall ensue,
You may in some wise be His counterpart;
That grace of His may your dear life imbue,
And give you strength to do, and not to do.

Ah,baby mine, with lifetime just begun,
May you be true as Mary's little Son!

Jean Rushmore

JUSTICE FOR THE COUNTRY SCHOOL

(Continued from November number)

A FAIR DEMAND

Of this condition of affairs, unavoidable at the present time at least, country people make no complaint, but what they do ask is that the disadvantage be reduced to a minimum. This can be done in two ways. First by bringing the institutions of secondary education, the collegiate institutes and high schools, as near the country people as possible; and second, by raising the common elementary schools to as high a standard as circumstances will permit. A good common school should be able to give a thorough general grounding, and that, after all, is the basis of all education. A country boy or girl who goes no farther will at least be certain of that; and those who go farther will, because of such thorough grounding, be able to make better use of the advantages offered by higher institutions.

Rural residents therefore, have a right to demand from the provincial authorities that they do all in their power to make the rural common schools efficient; and in order to do this a generous share of the provincial school funds should be set aside for the maintenance of those institutions which mean so much to the people on the the land.—*Exchange.*

SANTA CLAUS AND LITTLE BILLEE

By John Kendrick Bangs

ILLUSTRATED BY GORDON ROSS

(Copyrighted, The Frank A. Munsey Co.)

HE was only a little bit of a chap, and so, when for the first time in his life he came into close contact with the endless current of human things, it was as hard for him to "stay put" as for some wayward little atom of flotsam and jetsam to keep from tossing about in the surging tides of the sea.

His mother had left him there in the big toyshop, with instructions not to move until she came back, while she went off to do some mysterious errand. She thought, no doubt, that with so many beautiful things on every side to delight his eye and hold his attention, strict obedience to her commands would not be hard. But, alas, the good lady reckoned not upon the magnetic power of attraction of all those lovely objects in detail. She saw them only as a mass of wonders which, in all probability, would so dazzle his vision as to leave him incapable of movement; but Little Billee was not so indifferent as all that.

When a phonograph at the other end of the shop began to rattle off melodious tunes and funny jokes, in spite of the instructions he had received, off he pattered as fast as his little legs would carry him to investigate. After that, forgetful of everything else, finding himself caught in the constantly moving stream of Christmas shoppers, he was borne along in the resistless current until he found himself at last out upon the street—alone, free, and independent.

It was great fun, at first. By and by, however, the afternoon waned; the sun, as if anxious to hurry along the dawn of Christmas Day, sank early to bed; and the electric lights along the darkening highway began to pop out here and there, like so many merry stars come down to earth to celebrate the gladdest time of all the year. Little Billee began to grow tired; and then he thought of his mama, and tried to find the shop where he had promised to remain quiet until her return. Up and down the street he wandered, until his little legs grew weary; but there was no sign of the shop, nor of the beloved face he was seeking.

Once again, and yet once again after that, did the little fellow traverse that crowded highway, his tears getting harder and harder to keep back, and then—joy of joys—whom should he see walking slowly along the sidewalk but Santa Claus himself! The saint was strangely decorated with two queer-looking boards, with big red letters on them, hung over his back and chest; but there was still that same kindly, gray-bearded face, the red cloak with the fur trimmings, and the same dear old cap that the children's friend had always worn in the pictures of him that Little Billee had seen.

With a glad cry of happiness, Little Billee ran to meet the old fellow, and put his hand gently into that of the saint. He thought it very strange that Santa Claus's hand should be so red and cold and rough, and so chapped; but he was not in any mood to be critical. He had been face to face with a very disagreeable situation. Then, when things had seemed blackest to him, everything had come right again; and he was too glad to take more than passing notice of anything strange and odd.

Santa Claus, of course, would recognize him at once, and would know just how to take him back to his mama at home—wherever that might be. Little Billee had never thought to inquire just where home was. All he knew was that it was a big gray stone house on a long street somewhere, with a tall iron railing in front of it, not far from the park.

"Howdidoo, Mr. Santa Claus?" said Little Billee, as the other's hand unconsciously tightened over his own.

"Why, howdidoo, kiddie?" replied the old fellow, glancing down at his new-found friend, with surprise gleaming from his deep-set eyes. "Where did you drop from?"

While Telemachos and Mentor were chatting, the suitors called for the bard, or singer, who was always an honored person in the court of a Greek king, to sing for them, and the bard began to sing of the famous deeds of Odysseus. Then the beautiful queen, Penelope, came from her chamber, and rebuked the bard, bacause his song reminded her the more of her sorrow. But Telemachos, stirred by Athena's words, told his mother to keep to her woman's work, and leave it to him to rule in the man's part of the house. So Penelope, hurt and surprised, yet pleased to realize that Telemachos was fast becoming a man and taking on a man's authority in the court, went back to her weaving among her maidens.

Next day Telemachos called a council and spoke boldly to the suitors, as Athena had advised; but they laughed rudely at him, and refused to go away, and one of them said they could not trust Penelope, and he told how she had tricked them once before.

When they had insisted that she must marry one of them, she had finally promised to choose a husband when she should have finished a fine robe she was weaving. They had waited and waited, but still the robe had never been done, until, finally, one of Penelope's maidens had betrayed that every night the queen had pulled out all the threads that she had woven in the day. Naturally, the suitors had been very angry, and now they would not go away until she would choose one of them.

When Telemachos saw that it was of no use to appeal to them, he determined to set out secretly, as Athena had suggested, and search for his father; and with the help of twenty young men of Ithaca, and his old nurse, he fitted out and provisioned a boat, and set sail for sandy Pylos, the home of wise old Nestor, who had loved his father. Penelope, even, did not know, until after he had gone, and then how anxiously she watched for his return!

MARGARET GRAY.

"Oh, I'm out," said Little Bille bravely. "My mama left me a little while ago while she went off about something, and I guess I got losted."

"Very likely," returned the old saint with a smile. "Little two-by-four fellers are apt to get losted when they start in on their own hook, specially days like these, with such crowds hustlin' around."

"But it's all right now," suggested Little Billee hopefully. "I'm found again, ain't I?"

"Oh, yes, indeedy, you're found all right, kiddie," Santa Claus agreed.

"And pretty soon you'll take me home again, won't you?" said the child.

"Surest thing you know!" answered Santa Claus, looking down upon the bright but tired little face with a comforting smile. "What might your address be?"

"My what?" asked Little Billee.

"Your address," repeated Santa Claus. "Where do you live?"

The answer was a ringing peal of childish laughter.

"As if you didn't know that!" cried Little Billee, giggling.

"Ha, ha!" laughed Santa Claus. "Can't fool you, can I? It would be funny if, after keeping an eye on you all these years since you was a babby, I didn't know where you lived, eh?"

"Awful funny," agreed Little Billee. "But tell me, Mr. Santa Claus, what sort of a boy do you think I have been?" he added with a shade of anxiety in his voice.

"Pretty good—pretty good," Santa Claus answered, turning in his steps and walking back again along the path he had just traveled—which Little Billee thought was rather a strange thing to do. "You've got more white marks than black ones—a good many more—a hundred and fifty times as many, kiddie. Fact is, you're all right—'way up among the good boys; though once or twice last summer, you know—"

"Yes, I know," said Little Billee meekly, "but I didn't mean to be naughty."

"That's just what I said to the book-keeper," said Santa Claus, "and so we gave you a gray mark—half white and half black—that doesn't count either way, for or against you."

"Thank you sir," said Little Billee, much comforted.

"Don't mention it; you are very welcome, kiddie," said Santa Claus, giving the youngster's hand a gentle squeeze.

"Why do you call me 'kiddie' when you know my name is Little Billee?" asked the boy.

"Oh, that's what I call all good boys," explained Santa Claus. "You see, we divide them up into two kinds—the good boys and the naughty boys—and the good boys we call kiddies, and the naughty boys we call caddies, and there you are."

Just then Little Billee noticed for the first time the square boards that Santa Claus was wearing.

"What are you wearing those boards for, Mr. Santa Claus?" he asked.

If the lad had looked closely enough, he would have seen a very unhappy look come into the old man's face; but there was nothing of it in his answer.

"Oh, those are my new-fangled back-and-chest protectors, my lad," he replied. "Sometimes we have bitter winds blowing at Christmas, and I have to be ready for them. It wouldn't do for Santa Claus to come down with the sneezes at Christmas-time, you know—no, sirree! This board in front keeps the wind off my chest, and the one behind keeps me from getting rheumatism in my back. They are a great protection against the weather".

"I'll have to tell my papa about them,', said Little Billee, much impressed by the simplicity of this arrangement. "We have a glass board on the front of our ortymobile to keep the wind off Henry—he's our shuffler—but papa wears a fur coat, and sometimes he says the wind goes right through that. He'll be glad to know about these boards".

"I shouldn't wonder", smiled Santa Claus. "They aren't very becoming, but they are mighty useful. You might save up your pennies and give your papa a pair like 'em for his next Christmas".

Santa Claus laughed as he spoke; but there was a catch in his voice which Little Billee was too young to notice.

"You've got letters printed there," said the boy, peering around in front of his companion. "What do they spell? You know I haven't learned to read yet."

"And why should you know how to read at your age?" said Santa Claus. "You're not more than—"

"Five last month," said Little Billee proudly. It was such a great age!

"My, as old as that?" cried Santa Claus. "Well, you are growing fast! Why, it don't seem more than yesterday that you was a pink-cheeked babby, and here you are big enough to be out alone! That's more than my little boy is able to do."

Santa Claus shivered slightly, and Little Billee was surprised to see a tear glistening in his eye.

"Why, have you got a little boy?" he asked.

"Yes, Little Billee," said the saint. "A poor white-faced little chap, about a year older than you, who—well, never mind, kiddie—he's a kiddie, too—let's talk about something else, or I'll have icicles in my eyes."

"You didn't tell me what those letters on the boards spell," said Little Billee.

" 'Merry Christmas to Everybody!' " said Santa Claus. "I have the words printed there so that everybody can see them; and if I miss wishing anybody a merry Christmas he'll know I meant it just the same."

"You're awful kind, aren't you?" said Little Billee, squeezing his friend's hand affectionately. "It must make you very happy to be able to be so kind to everybody!"

II

SANTA CLAUS made no reply to this remark, beyond giving a very deep sigh, which Little Billee chose to believe was evidence of a great inward content. They walked on now in silence, for Little Billee was beginning to feel almost too tired to talk, and Santa Claus seemed to be thinking of something else. Finally, however, the little fellow spoke.

"I guess I'd like to go home now, Mr. Santa Claus," he said. "I'm tired, and I'm afraid my mama will be wondering where I've gone to."

"That's so, my little man," said Santa Claus, stopping short in his walk up and down the block. "Your mother will be worried, for a fact; and your father, too—I know how I'd feel if my little boy got losted and hadn't come home at dinner-time. I don't believe you know where you live, though—now, honest! Come! 'Fess up, Billee, you don't know where you live, do you?"

"Why, yes, I do", said Little Billee. "It's in the big gray stone house with the iron fence in front of it, near the park."

"Oh, that's easy enough!" laughed Santa Claus nervously. "Anybody could say he lived in a gray stone house with a fence around it, near the park; but you don't know what street it's on, nor the number, either. I'll bet fourteen wooden giraffes against a monkey on a stick!"

"No, I don't," said Little Billee frankly; "but I know the number of our ortymobile. It's—'N. Y.' "

"Fine!" laughed Santa Claus. "If you really were lost, it would be a great help to know that; but not being lost, as you ain't, why, of course, we can get along without it. It's queer you don't know your last name, though."

"I do, too, know my last name!" blurted Little Billee. "It's Billee. That's the last one they gave me, anyhow."

Santa Claus reflected for a moment, eyeing the child anxiously.

"I don't believe you even know your papa's name," he said.

"Yes, I do," said Little Billee indignantly. "His name is Mr. Harrison."

"Well, you are a smart little chap," cried Santa Claus gleefully. "You got it right the very first time, didn't you? I really didn't think you knew. But I don't believe you know where your papa keeps his bake-shop, where he makes all those nice cakes and cookies you eat."

Billee began to laugh again.

"You can't fool me, Mr. Santa Claus," he said. "I know my papa don't keep a bake-shop just as well as you do. My papa owns a bank."

"Splendid! Made of tin, I suppose, with a nice little hole at the top to drop pennies into?" said Santa Claus.

"No, it ain't, either!" retorted Little Billee. "It's made of stone, and has more than a million windows in it. I went down there with my mama to papa's office the other day, so I guess I ought to know."

"Well, I should say so," said Santa Claus. "Nobody better. By the way, Billee, what does your mama call your papa? 'Billee,' like you?" he added.

"Oh, no, indeed," returned Little Billee. "She calls him papa, except once in a while when he's going away, and then she says, 'Good-by, Tom.' "

"Fine again!" said Santa Claus, blowing upon his fingers, for, now that the sun had completely disappeared over in the west, it was getting very cold. "Thomas Harrison, banker," he muttered to himself. "What with the telephone-book and the city directory, I guess we can find our way home with Little Billee."

"Do you think we can go now, Mr. Santa Claus?" asked Little Billee, for the cold was beginning to cut through his little coat, and the sandman had started to scatter the sleepy-seeds all around.

"Yes, sirree!" returned Santa Claus promptly. "Right away off now instantly at once! I'm afraid I can't get my reindeer here in time to take us up to the house, but we can go in the cars—hum! I don't know whether we can or not, come to think of it. Ah, do you happen to have ten cents in your pocket?" Santa added with an embarrassed air. "You see, I've left my pocketbook in the sleigh with my toypack; and, besides, mine is only toy-money, and they won't take that on the cars."

"I got twenty-fi' cents," said Little Billee proudly, as he dug his way down into his pocket and brought the shining silver piece to light. "You can have it, if you want it."

"Thank you," said Santa Claus, taking the proffered coin. "We'll start home right away; only come in here first, while I telephone to Santaville, telling the folks where I am."

He led the little fellow into a public telephone station, where he eagerly scanned the names in the book. At last it was found—"Thomas Harrison, seven-six-five-four Plaza." And then, in the seclusion of the telephone-booth, Santa Claus sent the gladdest of all Christmas messages over the wire to two distracted parents:

I have found your boy wandering in the sreet. He is safe, and I will bring him home right away.

III

FIFTEEN minutes later, there might have been seen the strange spectacle of a foot-sore Santa Claus leading a sleepy little boy up Fifth Avenue to a cross-street, which shall be nameless. The boy vainly endeavored to persuade his companion to "come in and meet mama."

"No, Billee," the old man replied sadly, "I must hurry back. You see, kiddie, this is my busy day. Besides, I never go into a house except through the chimney. I wouldn't know how to behave, going in at a front door."

But it was not to be as Santa Claus willed, for Little Billee's papa, and his mama, and his brothers and sisters, and the butler and the housemaids, and two or three policeman, were waiting at the front door when they arrived.

"Aha!" said one of the police, seizing Santa Claus roughly by the arm. "We've landed you, all right! Where have you been with this boy?"

"You let him alone!" cried Little Billee, with more courage than he had ever expected to show in the presence of a policeman. "He's a friend of mine."

"That's right, officer," said Little Billee's father; "let him alone—I haven't entered any complaint against this man."

"But you want to look out for these fellers, Mr. Harrison," returned the officer. "First thing you know they'll be makin' a trade of this sort of thing."

"I'm no grafter!" retorted Santa Claus indignantly. "I found the little chap wandering along the street, and, as soon as I was able to locate where he lived, I brought him home. That's all there is to it."

"He knew where I lived all along," laughed Little Billee, "only he pretended he didn't, just to see if I knew."

"You see, sir," said the officer, "it won't do him any harm to let him cool his heels—

"It is far better that he should warm them, officer," said Mr. Harrison kindly. "And he can do that here. Come in, my man," he added, turning to Santa Claus with a grateful smile. "Just for a minute, anyhow. Mrs. Harrison will wish to thank you for bringing our boy back to us. We have had a terrible afternoon."

"That's all right, sir," said Santa Claus modestly. "It wasn't anything, sir. I didn't really find him—it was him as found me, sir. He took me for the real thing, I guess."

Nevertheless, Santa Claus, led by Little Billee's persistent father, went into the house. Now that the boy could see him in the full glare of many electric lights, his furs did not seem the most gorgeous things in the world. When the flapping front of his red jacket flew open, the child was surprised to see how ragged was the thin gray coat it covered; and as for the good old saint's comfortable stomach—strange to say, it was not!

"I—I wish you all a merry Christmas," faltered Santa Claus; "but I really must be going, sir—"

"Nonsense!" cried Mr. Harrison. "Not until you have got rid of this chill, and—"

"I can't stay, sir," said Santa. "I'll lose my job if I do."

"Well, what if you do? I'll give you a better one," said the banker.

"I can't—I can't!" faltered the man. "I—I—'ve got a Little Billee of my own at home waitin' for me, sir. If I hadn't," he added fiercely, "do you suppose I'd be doin' this?" He pointed at the painted boards, and shuddered. "It's him as has kept me from—from the river!" he muttered hoarsely; and then this dispenser of happiness to so many millions of people all the world over sank into a chair, and, covering his face with his hands, wept like a child.

"I guess Santa Claus is tired, papa," said Little Billee, snuggling up closely to the old fellow and taking hold of his hand sympathetically. "He's been walk in' a lot to-day."

"Yes, my son," said Mr. Harrison gravely. "These are very busy times for Santa Claus, and I guess that, as he still has a hard night ahead of him, James had better ring up Henry and tell him to bring the car around right away, so that we may take him back— to his little boy. We'll have to lend him a fur coat to keep the wind off, too, for it is a bitter night."

"Oh," said Little Billee, "I haven't told you about these boards he wears. He has 'em to keep the wind off, and they're fine, papa!" Little Billee pointed to the two sign-boards which Santa Claus had leaned against the wall. "He says he uses 'em on cold nights," the lad went on. "They have writing on 'em, too. Do you know what it says?"

"Howdidoo, Mr. Santa Claus?

"Yes," said Mr. Harrison, glancing at the boards. "It says 'If You Want a Good Christmas Dinner for a Quarter, Go to Smithers's Café.' "

Little Billee roared with laughter.

"Papa's trying to fool me, just as you did when you pretended not to know where I lived, Santa Claus," he said, looking up into the old fellow's face, his own countenance brimming over with mirth. "You mustn't think he can't read, though," the lad added hastily. "He's only joking."

"Oh, no, indeed, I shouldn't have thought that," replied Santa Claus, smiling through his tears.

"I've been joking, have I?" said Little Billee's papa. "Well, then, Mr. Billiam, suppose you inform me what it says."

" 'Merry Christmas to Everybody' " said Little Billee proudly. "I couldn't read it myself, but he told me what it said. He has it printed there so that if he misses saying it to anybody, they'll know he means it just the same."

"By Jove, Mr. Santa Claus," cried Little Billee's papa, grasping the old man warmly by the hand, "I owe you ten million apologies! I haven't believed in you for many a long year; but now, sir, I take it all back. You do exist, and, by the great horn spoon, you are the real thing!"

V

LITTLE BILLEE had the satisfaction of acting as host to Santa Claus at a good, luscious dinner, which Santa Claus must have enjoyed very much, because, when explaining why he was so hungry, it came out that the poor old chap had been so busy all day that he had not had time to get any lunch—no, not even one of those good dinners at Smither's café, to which Little Billee's father had jokingly referred. And after dinner Henry came with the automobile, and, bidding everybody good night, Santa Claus and Little Billee's papa went out of the house together.

Christmas morning dawned, and Little Billee awoke from wonderful dreams of rich gifts, and of extraordinary adventures with his new-found friend, to find the reality quite as splendid as the dream things. Later, what was his delight when a small boy, not much older than himself—a pale, thin, but playful little fellow—arrived at the house to spend the day with him, bringing with him a letter from Santa Claus himself! This was what the letter said:

DEAR LITTLE BILLEE:

You must not tell anybody except your papa and your mama, but the little boy who brings you this letter is my little boy, and I am going to let you have him for a playfellow for Christmas Day. Treat him kindly for his papa's sake, and if you think his papa is worth loving tell him so. Do not forget me, Little Billee. I shall see you often in the future, but I doubt if you will see me. I am not going to return to Twenty-Third Street again, but shall continue my work in the Land of Yule, in the Palace of Good-Will, whose beautiful windows look out upon the homes of all good children.

Good-by, Little Billee, and the happiest of happy Christmases to you and all of yours. Affectionately,

SANTA CLAUS.

When Little Billee's mama read this to him that Christmas morning, a stray little tear ran down her cheek and fell upon Little Billee's hand.

"Why, what are you crying for, mama?" he asked.

"With happiness, my dear little son," his mother answered. "I was afraid yesterday that I might have lost my little boy forever, but now—"

"You have an extra one thrown in for Christmas, haven't you?" said Little Billee, taking his new playmate by the hand. The visitor smiled back at him with a smile so sweet that anybody might have guessed that he was the son of Santa Claus.

As for the latter, Little Billee has not seen him again; but down at his father's bank there is a new messenger, named John, who has a voice so like Santa Claus's voice that whenever Little Billee goes down there in the motor to ride home at night with his papa, he runs into the bank and has a long talk with him, just for the pleasure of pretending that it is Santa Claus he is talking to. Indeed, the voice is so like that once a sudden and strange idea flashed across Little Billee's mind.

"Have you ever been on Twenty-Third Street, John?" he asked.

"Twenty-Third Street?" replied the messenger, scratching his head as if very much puzzled. "What's that?"

"Why, it's a street," said Little Billee rather vaguely.

"Well, to tell you the truth, Billee," said John, "I've heard tell of Twenty-Third Street, and they say it is a very beautiful and interesting spot. But, you know, I don't get much chance to travel. I've been too busy all my life to go abroad."

"Abroad!" roared Little Billee, grinning at John's utterly absurd mistake. "Why, Twenty-Third Street ain't abroad! It's up-town—near—oh, near—Twenty-Second Street,"

"Really?" returned John, evidently tremendousle surprised. "Well, well, well! Who'd have thought that? Well, if that's the case, some time when I get a week off I'll have to go and spend my vacation there!"

From which Little Billee concluded that his suspicion that John might be Santa Claus in disguise was entirely without foundation in fact.

FARM WEEDS

THIS subject might very profitably be discussed by Farmers' Clubs during their winter meetings. Much valuable information may be obtained in "Farm Weeds of Canada", in Georgia's "Manual of Weeds", published by the Macmillan Company, and in the Bulletin entitled "Weeds of Ontario" published by the Ontario Department of Agriculture, Toronto.

Believing that the weed problem is a very serious one for agriculture in Quebec, we begin with this number a series of articles on weeds and weed eradication. Editor.)

ARTICLE I.

CAUSES OF PREVALENCE OF WEEDS

The presence of so many noxious weeds on the farms of Quebec is a strong indication that something is wrong in the method of cultivation employed. The financial loss every year must be very large, as weeds not only increase the cost of harvesting the crop but also lessen the crop yield and the value of the crop.

Absence of a system of Rotation. — The recent partial Census made by the Conservation Commission of Canada reveals the fact that on a large percentage of the farms no attempt is made to introduce a regular system of rotation of crops, without which it is practically impossible to keep the weeds under control. Large areas, for example, are devoted to the production of oats and hay for a number of years without a break. As a result, couch grass, mustard, ox-eye daisy, the thistles, paint brush and other weeds thrive without hindrance, and get possession of the land.

Neglect of careful cultivation. — Again, the lack of proper careful preparation of the land for the crop is partially responsible for the great increase of weeds in recent years. Frequently we have seen an infected sod field broken up by the plow in the spring, and after one stroke of the harrow seeded to grain. As frequently we have seen fields devoted to roots or corn given so little attention by the cultivator during the summer that weeds completely choked the crop.

Neglect of after-harvest cultivation. — Moreover, many farmers fail to cultivate grain fields after harvest, thereby permitting the weed seeds to ripen with the crop and to fail to the ground. In such cases the weeds will come up in large numbers the following season.

Sowing impure Seed. — One of the chief factors in the rapid spread of weeds is the thoughtless sowing of impure seed. The Seed Control Act has protected the farmer during recent years, but even yet frequent instances come to light where farmers of their own accord buy impure seed simply because it was cheaper than the pure seed. When farmers buy seed grain from their neighbors they should be extremely careful to clean it properly before planting. Many a farm has become polluted with weeds when no care has been taken to get pure seed.

Abandonment of the sheep industry. — It is interesting to note that weeds have multiplied rapidly since the farmers have ceased to keep sheep. These animals are undeniably weed-destroyers, and every farmer should by all means keep a flock if for no other reason than this one.

Failure to cut weeds before they ripen. — Weeds often spread from neglected pastures, lanes, farmyards, roadsides and fence-corners to cultivated fields. This danger can be minimised by repeated cutting of the weeds in such places during the summer so as to prevent them ripening and forming seed. A few hours work with a scythe every two or three weeks in summer would be effort well spent in every farm.

Useful service of weeds. — While we must acknowledge that weeds are a great evil, causing great losses to the farmer, yet we sometimes feel that they are not altogether an unmixed evil. Undoubtedly some radical change must come in our methods of farming, for we are not farming to the best advantage. As we have already stated, our system of cultivation of the soil is woefully out of date; and we believe that weeds will compel the farmer, whether he would or no, to adopt modern and better practices. If they will bring about this much-to-be-desired change, then we must confess that they are performing a useful service.

(To be continued).

W. L.

MISTRESS MARY SHAKESPEARE AND HER FAMOUS SON

(Continued from our November issue)

THOSE were days when Christmas was observed with royal ceremony. For weeks before the festival, young Shakespeare's heart doubtless throbbed with anticipation as the hearts of boys have throbbed before his time and since. But the true tingle of excitement would begin when the drowsy lad in his soft warm bed was awakened by the sound in the quiet night of some sweet old carol, such as "When Joseph was a-walking", sung by harmonious voices in the street below to the music of the psaltery. The great moment of the day must have finally arrived when walking with his parents through the twilit town they branched off through the woods towards the hall of Stratford's most important magnate; the thick smoke from its chimneys showing blue against the stars, an evidence of the fires blazing on the hearths within; to be met at its door by the steward and marshalled to his place at the table groaning with good cheer; to see the Boar's Head carried in in solemn state; to listen in delight to the speech of the Lord of Misrule made to the Lord and Lady of the Manor; then to help in the clearing of the hall; to beat time with hand and foot to the gay dance that followed, sometimes to join in its easier figures; till the curfew sounded and a tired but joyous being, he walked home again between his parents in the moonlight.

Couch grass, one of our worst creeping perennial weeds.

If it is was to his father that the lad turned for discussion of his graver studies, it was probably to his mother and young sister that he would unfold the tales of romance and chivalry with which his restless imagination teemed. Among the books of such households as the Shakespeare's there would then be found most of the popular works printed by old Wynkyn de Worde, who followed closely in Caxton's footsteps. For, hard as the fact is to realise, in Shakespeare's day printing was not a century old. Among the favourites on those bookshelves would be collections of old carols, and of stirring ballads of the sea, side by side with such tales as the Lytell Geste of Robin Hode, and Arthur of Lytell Bretayne, and collections of roughly sketched out Plays and Dialogues, while most honoured of all in its teaching of high things and in the music of its rhythm, would be the brand-new copy of the Bible so recently done into the simple Anglo-Saxon tongue.

Pigweed or Red Root is a common annual weed which produces shining black seeds abundantly.

Little that is authentic has been handed down regarding the youthful days of Shakespeare. His early marriage at the age of eighteen, with its accompanying responsibilities, may have shortened the reckless period usually given to the "sowing of wild oats." From his writing we know that he was familiar with sports of all kinds, with archery, the otter-chase, angling, and games of the time, such as Quintain or Saracen's Head; that if he did not hunt the foxes and hares over the hills in person, at least he had watched the hunt till every incident of it was imprinted on his memory even to the sound of the horns and the musical baying of the "bell-mouthed" hounds. An idea seems to have gained acceptance with the years that Shakespeare's marriage was a fatal mistake, his wife being seven years older than himself. That mistake is probably in the minds of its believers only. To one who realises the forwardness and maturity of the poet's mind, it is natural enough that he should have found the riper beauty of person and more experienced mind of a mature woman of twenty-five more congenial than that of an undeveloped girl. It must have been a pretty sight, that wedding of Shakespeare's. The handsome bride in the very bloom and ripeness of her beauty, led by a group of fair-haired boys, the young bridegroom following with his young neighbours, wit on his lips, worship in his eyes, deep seriousness within his heart of hearts. Early marriages among the country folk were then the rule. Wooden benches and green rushes on the floor were the accepted decoration of the bridal home. Lands and flocks furnished the necessaries of life for such new households. The families of Shakespeare and Hathaway had been old friends for a generation. Will Shakespeare and Anne Hathaway had played together as little children. Their social rank was on a level. The idea of the marriage was probably a familiar possibility to both families if not a foregone conclusion. That the disparity in their ages created unhappiness between them later is a modern idea based on certain of the poet's sonnets. Whether it be true or not that their ardour cooled down in time to a distinct weariness of each other, at all events they kept to their vows, fulfilled their duties to their children and respected the bonds they had deliberately accepted.

Another story that is falling into disrepute is that Shakespeare's journey to London was due to his own indiscretion, first in poaching on his neighbour's property and then in pasting on that neighbour's gates certain insulting verses. A careful study of the sources of this story rather encourages the contrary belief—the belief that Shakespeare's departure to London in his twenty-second year, and after he had become the father of three children, was due to an honourable effort on his part to help his father out of a temporary difficulty in money matters, and not to the fact of an estrangement from his wife, or of deer-

Devils' Paint Brush has orange flower-heads, and produces mats which crowd out other vegetation.

stealing in his neighbour's park. On this point his earliest biographer has written: "This William, *being naturally inclined to poetry and acting*, came to London, I guess about eighteen, and was an actor in the playhouses and did act exceedingly well".

How exceedingly well is proved by the fact that eleven years later the poet was able to buy the prettiest estate in Stratford for his family and that nothing more is heard of his father's straitened means. On the contrary, we find John Shakespeare, at this date, successful in obtaining from the College of Arms "bearings showing forth his gentle lineage", a coat-of-arms then granted only to men of "landed substance".

From the date of Shakespeare's departure to London in 1586 to the time of his return to Stratford in 1604, he continued to act in the Blackfriars and Globe Theatres. He became a part proprietor in both these houses, an interest, he maintained up to the year 1612.

The merest suggestive description of his life in London would fill many pages, so wide and varied was the experience it included—experience of the highest and lowest in the land, of the courts of two sovereigns and of the frequenters of the pits of two theatres; an experience that included the production of twenty of his most wonderful works. Yet with all the press and stir of London life at one of England's most stirring periods, the poet's heart was nearest to his home and family. We are told of his yearly visits to Stratford, probably made in late summer and autumn when the theatres were closed. One of those journeys we know must have been filled with sadness—that of the year 1596, when his only son Hamnet, a boy of eleven, and one of twin children, was buried. In the depths of that lingering sorrow, hope must have sprung afresh in the hearts of the distressed family, when the poet disclosed his plan of purchasing the most desirable property in the little town, that of "New Place", the property of the Clopton family, and of coming back to write at his ease and to spend the remainder of his days with his wife and children in its lovely surroundings.

That happy day, however, was as yet a future prospect. The beginning of the new century saw Shakespeare still in London—but prospering, for a further property was bought for the use of his brothers. The approaching shadows of life's evening time now became apparent when, in 1601, John Shakespeare died. It was then that the relationship between Mistress Mary and her son must have reached its flood, when the thoughtful affection of the poet wrapped his old mother about in her loneliness, sharing as only he could share it, something of the darkness, the vacancy and the silence of her grief.

Chicory has blue flowers, and a thick tap root which makes it difficult of eradication.

Hardhack or Steeple Bush a common weed in clearings and some pastures.

Still London would not let her poet go. In the year 1603, while he was busy on Candlemas Eve preparing a new play to be acted for the amusement of the tottering old Queen, the startling news of her death was circulated. Then greater demands held him to the spot when he was commanded to produce six of his plays before King James and the Stewart Prince.

At last his opportunity came. In the year 1604 he remained just long enough in London to see the publication of Hamlet, the first of any of his plays to be printed. Then he turned his steps homeward to "New Place", where his family now were living on the familiar shores of the Avon. There he was to fill up with a noble work the ten years of life still allotted him, in writing the rest of those wonderful dramas of passion, and romance, and history, that have crowned with undying glory this man who twenty years before had deliberately adopted one of the most despired and denounced professions of his time and lifted it up to an ideal dignity.

That home-coming must have warmed the heart of Mistress Mary as with the sunshine of new spring—in the illumining joy of seeing this son so dear to her, so beloved by his family, so honoured by his king, once more at her side. To watch him strolling through the "pleached alleys" and across the green laws of "New Place" must have brought her sweet content, and with it, an abiding peace, in the knowledge that when the day of last farewell should come, his faithful protection would not fail her, till all that remained of her earthly being was lowered to rest beside the husband of her love in the tranquil stillness of the village church.

"SYLVIA"

PROTECT THE MANURE

AS compared to older countries, the farmers of America are shamefully wasteful in their methods of husbandry and especially is this true of that one great product of the farm—the manure crop. Knowing that manure is, in reality, fertility and that it has an intrinsic value if its plant food constituents were bought in the market, it is astounding the number of intelligent farmers who treat it with such apparent contempt, as though it were something to be got rid of in the easiest possible manner without regard to its real worth as a soil builder and a crop producer.

When land has produced a crop of grain or grass, there has always been taken from the soil a certain amount of the essential plant food elements contained therein, and every pound thus taken has an intrinsic value. For example a ton of clover hay takes from the soil some nitrogen, phosphoric acid and potash which is worth approximately $8.35 if bought in the market. Now, if this ton of clover hay is fed on the farm and the manure properly cared for it is possible to recover and return to the land three-fourths of the plant food above mentioned and contained in the ton of clover, or three fourths of $8.35; but from one cause or another most farmers do not do so. Probably 50 percent out of a possible 75 percent would be a liberal estimate of what is saved, under favorable conditions; and not over one-half under unfavorable conditions of the fertilizing value of a ton of clover is returned to the land. If this is the case it means a loss of over $3 on every ton of clover hay produced and which is the price paid for neglect in the matter of saving the manure made from it.

The chemist tells us that a ton of cattle manure, as it comes from the stable, contains nitrogen worth $2.71, phosphoric acid worth 33 cents and potash worth 94 cents, or a total of $3.98. He also tells us that if this same manure were thrown out into piles and allowed to weather for three months in an open yard it would lose nitrogen worth $1.27, phosphoric acid worth 5½ cents and potash worth 60 cents; or just about one-half of the original value so far as the three elements named are concerned. This, however, is not all the loss that weathering causes, for it would lose a considerable amount of organic matter by oxidation. In other words, it would lose in bulk; there would not be so many loads of manure in a weathered pile as in one not so weathered.

What the chemist has told us with regard to the loss due to weathering of manure for three months is fully borne out by the results of experiments at the Ohio Experiment Station, made to determine what the soil says in the matter of this loss. The actual increase (16-year average) in a three-crop rotation of corn, wheat and hay from a ton of yard manure on one-eighth of an acre of land was two bushels and 27 pounds of corn, one bushel and eight pounds of wheat and 113 pounds of hay. With corn at 70 cents per bushel, wheat 90 cents and hay $12 per ton, this would amount to $1.74, $1.02 and 68 cents, respectively, or $27.52 from the three crops on an acre of land, to say nothing of the increase in stover and straw. The increase (16-year average) from one ton of stall manure of the same kind applied directly from the stable, on one-eighth of an acre of land, was three bushels of corn, one bushel and 17 pounds of wheat and 187 pounds of hay worth $2.10, $1.16 and $1.12 respectively, or $35.04 in-

One comes across cases like this one sometimes. Note the big wastage of manure and the liability of contamination of the well

crease on an acre for the three crops. The difference, then, between the stall manure and the weathered manure, at the prices given is $7.52 in favor of the stall manure, or that well taken care of.

Now, if the actual field experiments prove that $7.52 may be saved on eight tons of manure, when all that is possible is put back on the land, it is only a mathematical calculation for any farmer who knows how many loads of manure he has to determine approximately how much his loss is on what manure he produces; and what his gain might have been had he taken the proper care of it. If the figures are accepted do they not show conclusively two things, namely: That there is a big loss each year in the manure crop on the ordinary farm which is absolutely unnecessary, and that a covered barn yard would be a paying investment from the standpoint of the saving of the manure alone?

But this is not all that a covered yard affords to the man who has one. There is room overhead to store straw. Cattle can be fed there in mild weather and exercised in very cold weather. Besides, it is a good place to drive in with the farm machinery during the active season, where it is under cover and is saved from weathering, as it were. The value of a covered yard in saving manure on a theoretical basis is enough to solve the problem in its favor. It is a well-known fact that a considerable portion of the nitrogen and potash is contained in the liquid excrement of farm animals and this part of the fertility of farm manure is, therefore, easily leached out if it is exposed to the elements during winter and spring when rain and snow is excessive. Every farmer realizes this when he sees a stream of dark-colored liquid passing from his barnyard to some near-by run—literally a stream of dollars slipping away without let or hindrance; and, the writer suspects, that in some cases without a thought on the part of the man most interested. A manure shed would save most of this loss and in the absence of a manure shed or covered yard hauling directly to the field and applying to sod land would prove beneficial. One of the advantages of a shed is that manure may be hauled in early spring when it might be frozen too much to be handled from an open yard.

A mighty good thought for every farmer is to consider a load of manure as having a value just the same as a load of hay or wheat, and that it will deteriorate in value if left exposed to the elements just as hay or wheat will; further, that the exposed manure, when applied to the land, will not produce so much of the crops which he turns into money and in which case it becomes a direct money loss. Save it.

Ohio Farmer

FACTORIES AND ARMAMENTS

WHEN this war is through with its world-wreckage the world will be fully pacifist. Those who formerly admired the art of war and the life of the soldier will begin to realize with the poet that

> "Peace too hath her victories no less renowned than war".

We shall begin to agree with Alfred Noyes when he wrote that lurid indictment of war called "The Wine Press'. We shall believe that Andrew Carnegie, with all his old notions about public libraries and pipe organs knew that war is the eternal enemy of industry when he spent two million dollars on the Palace of Peace at the Hague.

Meanwhile the war is going on. It intends to keep going on until war is crushed clean out of the world. And when it is over this country will discover that war with all its horrors is nothing but the hugest kind of satire on the folly on spending thousands of millions in armaments that might have been spent in factories, railways and warehouses, civic improvements and comfortable homes.

When the war is over the efficient peoples of the earth will remember that one smokestack with a thousand men under it is worth more to the world than a thousand men on a warship loaded with thousands of tons of guns, armor-plate and engines of destruction. Canadians will remember that our industrial workers are a more potential army for the welfare of civilization than all the armies of Europe fighting in the cause of "culture" based upon brute force and explosives.

But the power of Canadian industry, greater than of war, depends upon the army of industrial workers being kept together, in a common cause. The—nation with power plants idle half the year gnd its payrolls of men on half time, is less than half efficient in the business of overcoming the earth and building up the economics of civilization.

A smokestack on a factory is worth a thousand smokestacks on warships. But the smokestacks of prosperity can only be kept going in this country so long as the people of Canada stand behind the industrial workers and the manufacturers of Canada. The people who believe in the triumphs of peace must prove their belief by spending their money for the goods made by their fellow-countrymen. Those who most deprecate war are those who do most to build up their own country in a time of peace and thereby make war impossible.

It is the dollars of Canada spent in purchasing the goods made by Canadians that tell in the great struggle of this part of the world agsinst the diabolical economic waste of war.

AGRICULTURAL CO-OPERATION IN WISCONSIN

A Digest of Bulletin 238, Wisconsin Agric., Exp. Station

CO-OPERATION is the working together of a number of persons for some common end. In agriculture, it means the organization of farmers for the transaction of business pertaining to farming. Its purpose is to do jointly what cannot be done as economically or as well by individuals.

Its success depends upon several factors. A sufficient amount of business is essential. The co-operators should live near enough together to have a community interest and personal acquaintance. The business transacted should be simple in nature, free from any great degree of speculation and of vital importance or convenience to the co-operators. Loyalty to the organization and an intelligent spirit of co-operation are fundamental. Leadership and harmony are essential and minor differences among co-operators must be subordinated to the common good.

The membership of the company should consist of active farmers; at least they should be in control. Outsiders, if admitted as they sometimes are to furnish capital, should not be allowed to influence the business policy toward large dividends on the investment The one-man-one-vote principle will keep the organization democratic. Mischief-makers and "drones" should be kept out but in no wise should a co-operative society become a "closed shop". A trust among farmers is as illegal as among other people.

The management of the company should, in general, lie with the board of directors. They should provide for an adequate but simple system of accounts and the books should be audited. The records of the business should be open at all times to all members. Details of management, however, must rest with a manager who should be thoroughly competent and trustworthy.

A federation of co-operative societies is of great benefit to local units. The largest and best known instance of the kind is the California Fruit Exchange. Attempts in federation along other lines are being made but, as yet, with rather indifferent success.

As a social and educational factor co-operation has developed to a remarkable extent in Europe, these mutual organizations taking the lead in community improvement, entertainment and recreation.

In Wisconsin the most extensive co-operative enterprises have been developed in the butter and cheese-making industries. Some half-dozen fruit-selling organizations have been formed, twenty or more associations for the shipping of live-stock and as many for the testing of cows. The largest number of co-operative societies in the state are the telephone and insurance companies.

UNIVERSITY OF ILLINOIS
JAN 1915

The JOURNAL of AGRICULTURE

AND HORTICULTURE

Volume 18 *January 1st 1915* *Number 7*

HERALDS OF SCIENTIFIC AGRICULTURE. THE MACDONALD COLLEGE AGRICULTURAL DEMONSTRATORS

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

DE LAVAL EQUIPMENT

For Farm, Dairy or Creamery

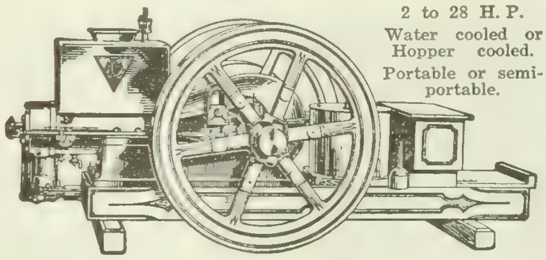
DE LAVAL equipment is first, last and always high grade and dependable and includes only such machines and supplies as are known to be absolutely reliable and "standard."

Ideal Green Feed Silos

IT isn't too early right now to plan for the erection of a silo next summer.

The more you investigate the advantage of having succulent silage to feed your cows all winter, the sooner you will decide to erect a silo; and if you thoroughly investigate the silo question you can scarcely escape the conclusion that the Ideal Green Feed Silo is the best silo for you to buy.

"Alpha" Gas Engine



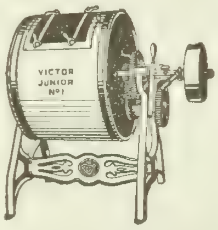
2 to 28 H. P.
Water cooled or Hopper cooled.
Portable or semi-portable.

Uses all fuels.
Easy to start.
Equipped with magneto.
Develops full power.

The most convenient, reliable and economical power for the farm, dairy, creamery or shop.

THE "ALPHA" Gas Engine is the highest grade and most reliable engine that you can buy for any purpose whatever; but on account of its simplicity of construction and reliability of operation it is unusually well adapted for farm use.

Dairy and Creamery Supplies



VICTOR CHURNS

THE DE LAVAL line of dairy and creamery supplies for milk dealers, creamerymen, cheese makers, and dairy farmers is by far the largest and most complete in Canada. We handle nothing but high grade goods, and successful dairymen know that this is the only kind they can afford to buy.

Our Service Department insures proper installation of all machines and supplies and is always ready to co-operate with our customers.

Any of these mailed upon request

Any of these mailed upon request

DE LAVAL DAIRY SUPPLY CO., Ltd.

LARGEST MANUFACTURERS OF DAIRY SUPPLIES IN CANADA.

Exclusive Canadian distributors of the "World Standard"
De Laval Cream Separators.

MONTREAL PETERBORO WINNIPEG VANCOUVER.

They use Maxwell's Churns in Denmark—

Fancy! Denmark—the great butter-producing country of the world—send all the way to Canada for Maxwell's Churns! Also used in Australia, New Zealand and S. Africa. Convincing proof, this, of the excellence of these well-known churns. Best of all is the—

Maxwell

"FAVORITE" CHURN (with Bow Lever)

Notice the adjustable handle on the bow lever. No other churn has this. Handle can be moved to centre or either side, whichever is most convenient for driving.

You can buy the "Favorite" in eight sizes. Strongest and best made churn on the market. Easy to work. Gives splendid results. Ask your dealer.

MAXWELL LIMITED, ST. MARY'S, ONTARIO

1

Cost of Living Reduced

that is as far as your livestock is concerned, in fact you cannot only actually reduce the cost of feeding, but in addition, **increase** the butter fat in the milk from your cows—increase the growth and weight of your cattle, sheep and pigs—and get better work and efficiency out of your horses.

All this can be accomplished by simply feeding regularly GENUINE

MOLASSINE MEAL

Made in England

Remember there are dozens of molasses meal preparations on the market but only **one MOLASSINE MEAL** which is the original and **genuine.**

Scientifically prepared and protected by patents.

Put up in bags containing 100 lbs. Get it at your dealers or write us direct.

Molassine Meal is guaranteed by the makers to keep in good condition for any length of time.

Look for this Trade Mark on every bag.

THE MOLASSINE CO. OF CANADA, LIMITED,

MONTREAL :: ST. JOHN, N.B. :: TORONTO.

Basic Slag

(Thomas Phosphate Powder)

Quebec farmers who use Basic Slag should take care that they are supplied with the Basic Slag manufactured in Sydney, Nova Scotia. If you buy Basic Slag imported from abroad you lessen employment in your own country at a time when it is of vital consequence to keep every Canadian factory running. Be a patriot and make certain you are supplied with the Basic Slag manufactured in Sydney, Nova Scotia. Every bag bears our tag giving our guarantee of quality.

For agencies in unrepresented districts write to:

The CROSS FERTILIZER Co. Limited

P. O. BOX 60, STATION "B"

QUEBEC.

or apply to our local Agents:

P. T. LEGARE, Limited

QUEBEC.

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 101,075
FRENCH, 91,550
ENGLISH, 9,525

Volume 18 · JANUARY 1st 1915 · Number 7

EDITORIAL

TO OUR READERS AND CONTRIBUTORS

JUST a year ago the Journal of Agriculture made its first appearance in its present dress. It had reached its eighteenth year and, like a debutante, it considered itself old enough and wise enough to assume a more dignified position before the public. The Journal has, we believe, maintained during the year its proud position among the leading agricultural magazines of America by producing articles of high merit in an attractive form.

We are much pleased that the Journal pleases its readers, and that their numbers are increasing month by month. We desire, however, to thank specially the contributors who have helped us freely month by month with timely and valuable articles.

Our thanks are also due the Hon. Mr. Caron, Minister of Agriculture, and the members of his Department for their untiring efforts to promote the best interests of the Journal.

FRONT-PAGE ILLUSTRATION

WE have pleasure in presenting to our readers this month the front-page illustration of the County Demonstrators. In the front row, reading from left to right are:—

R. E. Husk, of Huntingdon; E. A. Lods, of Cowansville; M. A. Jull, Lecturer in Poultry Husbandry at Macdonald College; V. B. Durling, of Richmond, and G. W. MacDougall of Lennoxville. In the second row are C. H. Hodge, formerly of Richmond; J. K. King, of Shawville; A. F. Emberley, of Ayer's Cliff, and A. E. Raymond, of Cookshire.

THE AGRICULTURAL SITUATION IN QUEBEC

READERS will find in this issue a number of special articles relating to various phases of the agricultural industry of this province which are worthy of careful perusal.

Dr. Harrison's address before the Canadian Club at Quebec deals with the work of Macdonald College in promoting the educational as well as the material side of the great industry. The addresses of Professor Barton and W. F. Stephen at the Winter Fair, Guelph, sum up clearly the live stock and dairy situation in the province. Mr. Grindley deals with the public handling of fruit, which is becoming an important problem for our fruit-growers. The Montreal Milk Supply and the work of the County Demonstrator are discussed in the Editorial columns.

These articles are longer than usual, but we believe that our readers will study them carefully during the long winter evenings and make them topics of discussion at the meetings of the Farmers' Clubs.

A LIVE STOCK STOCK-TAKING

IN an address on "The Live Stock situation in the province of Quebec" which we publish in our present issue, Professor Barton of Macdonald College gives an enlightening summing up of the resources and prospects of this province as a live stock producing country. It will be noted that the value of the live stock on the average farm has increased 55 per cent since 1901. The increase in numbers has been smaller, but nevertheless real in all branches of stock. We have even yet less than 20 animals per farm of 100 acres, while Ontario has 26. Even in milch cows, Ontario has a slight advantage. In sheep, however, Quebec has the distinction of being the only province in which decrease of numbers has been checked. That this decrease has ceased is a gratifying feature of the situation, for, as Professor Barton points out, our province appears to be particularly well adapted to the dairy and sheep-raising industries. In the former she has a well established position, her standing as a breeding district being well known and her record in the production of creamery butter one to be proud of. In sheep-raising she is just beginning to go forward and the prospects for her success in this line are bright. Under conditions prevailing in the live stock world to-day, our breeders can go forward with confidence.

THE MILK SHIPPED TO MONTREAL

THAT over two-thirds of the milk delivered to Montreal consumers is unfit for use as human food is the startling conclusion reached by Dr. Harrison, Dr. Savage and Mr. Sadler, of Macdonald College, as the outcome of a bacteriological investigation of the city's milk supply made in 1913 and 1914. This is a shockingly disgraceful state of affairs and is unquestionably closely related to that other stigma upon the good name of the city, the enormous infantile death rate. "Out of every hundred children born in the city of Montreal", we are told on the authority of Dr. A. D. Blackader, "thirty-two die before the end of their first year." This is over twice the corresponding death rate for England and Wales, greater than that for Russia-in-Europe, Austria or Spain, and four times that for New Zealand.

It behooves all those connected with the supply of milk to the people of Montreal to do their share towards improving conditions to the end that none but *pure, uncontaminated milk* may reach the mouths of the children of Montreal. And among those concerned are the dairy farmers of the surrounding rural districts. Not that the whole responsibility is laid upon the farmer. By no means. In fact ignorance and carelessness are even more prevalent among those who handle milk in the city than among the producers. But the Journal's duty is to the farmer and, accordingly, we confine our attention to the rural end of the question.

It is clear from the report that in every one of the rural districts visited by the investigators there are a few farmers who produce clean milk, milk meeting the requirements of the highest grade,—that is to say milk with less than 200,000 bacteria per cubic centimetre, of which less than 500 are of the "colon" and less than 2,000 of the "liquefier" group. About ten per cent of all the samples of rural milk analyzed were of this grade. But the majority of the farmers shipping to Montreal ship milk of Grade C.—fit for use only for cooking or manufacturing purposes,—or of Grade D.—unfit for use as human food in any form. Fifty-four per cent of the rural samples analyzed fell in these two grades.

A report of the Montreal Food Inspection department, quoted in the bulletin, shows also that a very large proportion of the dairy farms are not properly equipped for the production of pure milk. Ninety per cent of the stables inspected had insufficient ventilation; three-fourths had no drainage; two-thirds were unsufficiently lighted; less than one-third had a suitable dairy; less than one half had ice; and only six out of the 3,237 had the necessary equipment for cleaning milk cans.

Evidently there is much room for improvement of conditions on most of the farms. Unfortunately, however, there is but little financial inducement to the making of these improvements. Not only is there no extra remuneration offered to the farmer who produces clean milk, but there is the further fact that the price received for milk in Montreal is so low as to render necessary improvements in many instances economically impossible.

Three things would seem to be possible for dairy farmers to do towards the removal of this stain from the reputation of the milk trade of Montreal:

1. To make such home improvements as are financially possible. Among these should be (a) Scrupulous cleanliness in the stable and dairy, (b) Thorough cleaning and sterilization of all utensils. (c) Provision for rapid and adequate cooling of milk by means of ice. (d) Provision for delivery of the milk to the station in an adequately cooled condition.
2. To co-operate with the dealers and consumer in so organizing the industry as to (a) ensure a substantial financial return to the producer of good milk, (b) ensure the delivery of good milk to the homes of Montreal consumers.
3. To demand that the railways provide refrigerator cars for the conveyance of milk.

THE WORK OF THE COUNTY DEMONSTRATOR

COUNTY Agricultural Demonstrators have been at work in the English-speaking sections of Quebec for over three years. Their number has gradually increased until now there are seven, with offices in Shawville, Huntingdon, Cowansville, Lennoxville, Ayer's Cliff, Richmond and

CONTENTS

EDITORIALS.—To our Readers and Contributors. Front-Page Illustration; The Agricultural Situation in Quebec; A Live Stock Stock-Taking. The Milk shipped to Montreal; The Work of the County Demonstrator; Report of the Commission on Technical Education; Free Short Courses in Agriculture and Farm Home.

ORCHARD AND GARDEN. — Free Short Course in Horticulture; Annual Winter Meeting of the Quebec Pomological Society; Public Handling of Fruit; The Sugar Makers' Meeting!" The renovation of a Neglected Orchard.

FARM AND FARM CROPS.—Fifth Provincial Exhibition of Seed Grain; Reports Received; Alfalfa Demonstration Plots in Quebec; Farm Weeds; The War, Education and Agriculture in the Province of Quebec; Agricultural Progress in Pontiac County in 1914; Agricultural Progress in Huntingdon district; Agricultural conditions in Sherbrooke County. Agricultural progress in Compton county; Lennoxville Farmers' Club; Soil Management in relation to Yield and Quality in Seed; Ram not lifting water properly; Some basic principles of Agricultural Chemistry; Supply of Potash; Sayings worth remembering; Sweet Clover.

LIVE STOCK.—The Live Stock situation in the province of Quebec; Building up the Dairy Herd; A single-crop Dairyman; Inefficient Use of Horse Labour; Swine feeding; Official records of Holstein-Friesian cows; A 30,000-lb. Dairy cow; Deplorable scarcity of sheep in Canada; Metropolitan Live Stock Breeders' Association.

DAIRY.—The Milk Supply of Montreal; The Outlook of the Dairy Farmer in Eastern Canada.

POULTRY.—More Winter Eggs; The Farmer and the Poultry Industry.

WOMAN'S WORLD.—New Book; Foods and Food Preparation; Quebec Homemakers' Club in Richmond County; Homemakers' Clubs in Stanstead County; The Children's Homer; Cleaning Kitchen Ironware.

GENERAL INTEREST.—Protecting our Feathered Friends; Put more Brains into Farming; Two Statistical Year Books; Destruction of Rats; Farm Losses in Manure; Rotation of Crops; The Rural School; Hogs are profitable raised as Sideline; Comfortable cows give most milk.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

Cookshire. They are graduates of Macdonald College, and have been selected on account of their practical knowledge of and acquaintance with farm life. (In addition to these the Provincial Government has appointed a number of Agricultural Agents for French-speaking counties).

The work of the County Demonstrator is not easy; it demands ability, patience and tact of a high order. Difficulties and obstacles always abound, but these must be faced with a serene countenance as if they were trifles. His task is all the more difficult because he must determine his own line of action, that is, how he may best help the community in which he is placed. He is organizer, leader and worker at the same time, and his success depends upon the manner in which he performs these three functions. On account of the newness of the work the Demonstrator has no traditions to guide him; there are no "blazed trails" which he may follow. The nature of his work will necessarily be determined to a large extent by his training and personality, his previous experience, and the needs of the County.

⁂

The establishment of County Demonstrators is the latest step in the general movement of providing agricultural instruction to the persons engaged in the greatest of all industries—agriculture. For many years the Departments of Agriculture, the Experiment Stations and the Agricultural Colleges have been investigating questions relating to agriculture, and a vast amount of information has been accumulated. Efforts had been made for years to put this information into workable form and to apply it to the farming methods of the country, mainly by means of bulletins and lectures, but it was felt that such efforts did not produce the results expected.

The lectures and the bulletins, valuable as they undoubtedly are, reach but a small number of the farming community, and these do not need help as much as those who do not attend the meetings or read the bulletins. Consequently some plan had to be devised whereby all the farmers could be reached and brought into close touch with the best agricultural information and practice of the day. Hence arose the idea of placing men with a thorough practical and theoretical knowledge, each in a limited area, to co-operate with the farmers individually, and through their organizations, furthering their interests in every way possible.

⁂

The "Journal of Agriculture" has had frequent opportunities of studying the work of the County Demonstrators in this province, and to "cross the trail" of these men in their work. We have talked with the best farmers of their districts, and have observed some of the things they are doing; as a result we believe they have been making good. It is true that opposition and indifference to the Demonstrators exist in every locality, but such has been the fate of all new schemes for the betterment of the community. Most farmers who belittle the work of the Demonstrator either do not understand the idea underlying the movement, or have some objection to the man selected as Demonstrator. They resent the idea of a young graduate of an agricultural college, whom they always represent as a book man, coming into a district to show them how to farm, or they object to the attitude of the young man who is not to their liking.

⁂

It might be well here to state what a Demonstrator is *not*. He is not an *expert* in farming. He does not pose as one knowing all about agriculture. Such a person does not exist even in the best experiment station or agricultural college. Possessing a good agricultural education the Demonstrator should, however, be able to make suggestions towards the solution of certain farm problems. He is in a position to secure expert advice in different lines and thus give valuable help when required.

He is not an *adviser* in the sense that he has a lot of notions and theories which he desires the farmers of a district to adopt. On the other hand, he is rather a student of the best farm practices of his district so that he may be able to carry from farm to farm the information he has gained.

He is not an *intruder*. He does not present himself where he is not wanted. On the other hand, he is always ready to be of assistance where he is wanted. In this sense he is the servant of the community.

⁂

As no two counties have the same problems to solve, the same organizations to serve or the same kinds of people to deal with, so no two Demonstrators are working along the same lines. In some counties the people are grateful for any assistance given them, eagerly accept the leadership of the Demonstrator and readily co-operate in carrying out the ideas suggested. In other counties, on the other hand, enthusiasm is hard to arouse, and great difficulty is experienced in getting the people to co-operate. There, however, critics are sure to abound.

Each Demonstrator arranges as soon as possible to spend part of his time in studying the plans, methods and practices of the most successful farmers on their own farms. He notes the general condition of other farms, and the farm organizations such as Farmers' Clubs, etc., so that when the time is ripe he may be of some assistance in suggesting any needed improvements. (The making of a rural survey of a district, it appears to us, is one of the first duties of a Demonstrator). He finds frequently that the market and transportation conditions are not as satisfactory as they should be, and he lends his aid in bettering them and bringing about a co-operative marketing. One Demonstrator writes:— "It is far easier to make improvements in the market problem from the buying end of the farm operation, but greater result can be secured at the selling end. For example, it is far easier to obtain good seed grain for a number of farmers than it is to find a market for grain from a number of farmers."

Considerable attention has been given to the organization of School Fairs and Boys' and Girls' Clubs, to the teaching of Nature Study and Elementary Agriculture in schools, and to the arranging of Short Courses, lectures and demonstrations in Agriculture. In addition progress has been made in certain counties in tile-drainage which should mean much to the districts in increased crop production. In other counties efforts are being made to renovate old orchards, to improve the sheep and wool industry, to increase the production of potatoes, seed grain, and clover, and to grow alfalfa. In addition to all these there are the individual consultations with farmers on all kinds of matters, on plans for stables, drainage, feeds, water supply, sanitation, weeds, fungous diseases, insect pests, seed grain, clover seed production, etc., etc. Before giving definite advice he has very frequently to consult the experts at Macdonald College. All the Demonstrators are in close touch with the College at all times. It will be evident, then, that they are "common carriers of ideas" for the benefit of the community.

⁂

That the County Demonstrator is doing a most valuable work is the general opinion of persons best qualified to judge. It is evident, however, that if the best results are to be obtained he should be a "fixture" in the community, so that continuity of work may be maintained. Long tenure of position, moreover, has cumulative results which are very important to consider in this connection. However, in order to keep him it is necessary to offer such inducements as will ward off any offers which may come to him from outside.

Most of our Demonstrators are labouring at a considerable disadvantage for lack of assistance. At times it is impossible to overtake the work in hand, and many imprtant matters must go "by the board." Besides, much valuable time is spent in getting from place to place, and in most counties where long distances are to be covered this loss of time is very considerable.

Every demonstrator should be able to move rapidly, and if necessary he should be provided with an automobile.

The teaching of Nature Study and Elementary Agriculture in schools occupies much of the time of the Demonstrator during the winter months. It seems to us that while this arrangement is perhaps the only one possible at the present time, the Demonstrator should be relieved of this work as soon as possible to devote himself to other matters. Few, if any, of the Demonstrators are trained teachers, hence they are very liable to make such serious mistakes as may handicap them in their main efforts.

⁂

It may be of interest of learn how this movement is progressing elsewhere. In Ontario there are more than forty District Representatives, as they are called there, doing work similar to that done in this province. In the United States a great impetus has recently been given the movement by the passing of the Lever-Smith Bill by Congress, which provides large funds for demonstration work in agriculture and Household Science in every state, to be carried on co-operatively between the Federal and State departments of Agriculture. A new feature of the work is Farm Management Demonstration which aims at determining the main facts about the farm business. It necessitates the making of detailed surveys on a large number of farms of the crops, buildings, equipment, supplies, etc. All this means the expenditure of considerable money which the Canadian provinces have not yet at their disposal.

The Field Agents, as they are usually called in the States, perform very much the same duties as our men do in Quebec and Ontario. Experience is telling them, however, that it is advisable to supplement the County Demonstrators' service with departmental advisers in Animal Husbandry, Cereal Husbandry, Horticulture, Poultry, and other departments as the work develops. These departmental advisers are members of the College staff and assist the Demonstrators in studying the special and more technical problems which confront them in the field.

REPORT OF THE COMMISSION ON TECHNICAL EDUCATION

III

The Rural Schools of Denmark

(C). THE AGRICULTURAL SCHOOLS

THE Agricultural Schools have grown up out of the efforts of the farmers and their leaders to instruct and train young men for following farm life without subjecting them to influences from surroundings, instruction or occupation which would be likely to wean them from country life.

They are all residential schools; the pupils live together in a manner similar to that which has been described at length under the People's High Schools. In addition to the class rooms, and a small museum stocked with specimens useful for illustration and demonstration, the Agricultural School has a farm connected with it as part of its equipment.

The farm is not managed or run as an experimental station, and only to a very small extent does it use illustration plots. An illustration is given of the management of the farm as a whole according to the system and methods which yield the best results in the locality. The Principal is also the managing farmer. The preservation and increase of fertility, and the quantity, quality and suitability of the crops for market and for consumption, are considered. The numbers and the kinds of live stock are determined by the capacity of the farm as directed towards making profits. Since the institution receives a comparatively small grant from the State, it must be managed as a profit-making establishment, or at least in such a way as to make ends meet after paying salaries and providing for the upkeep.

At several places Agricultural Demonstration Stations, which are subsidized by the State and are not connected with the Agricultural Schools, offer additional opportunities for the students to observe the nature and progress of experiments. These are mainly directed towards the illustration of methods whereby the scientific knowledge and principles that have been proven of value are applied to land, crops, and live stock for profits.

The Agricultural Schools generally are located each close to one of the People's High Schools, and in some cases some of the teachers lecture in both schools.

Like the High Schools, they are private enterprises receiving a small subsidy from the State, varying from about $1,500 per annum downwards according to size and public service rendered. The combined subvention received by each Agricultural school from the state and the Local Authority averages about $1,000 per annum.

The State grants Scholarships to assist needy students. The conditions are similar to if not quite identical with those which obtain in the case of Scholarships for the People's High Schools. Scholarships are from 100 Kroner to 150 Kroner per student and cover about one-half of the expense including travelling, books, etc.

Two courses are provided, one of five or six months from November to May, and a fuller and more extended course continuing during May, June and July.

There are three Husmand Schools in Denmark. They were established as private enterprises to meet the recognised need of the Husmand (small farmer) for special instruction in the small cultures of his occupation.

There are also a school for women for Rural House-keeping, and a Royal Agricultural and Veterinary Institute similar to our Provincial Agricultural College.

TRAVELLING SCHOLARSHIPS

For more than half a century, under the auspices of the Royal Agricultural Society of Denmark, grants were made to assist young farmers to visit some of the best farms in the various districts in the Kingdom. The following is quoted from the evidence of Dr. Robertson before the Canadian Parliamentary Committee on Agriculture: "When I went to Denmark first, 25 years ago, I learned that the leaders of the movement for the improvement of agriculture there recognised the value of the teaching power of the most successful farmers in the Kingdom. The Royal Agricultural Society by means of grants enabled hundreds of young farmers to learn the systems and methods of farming from many of the best farms in the country. These young farmers lived and worked and learned on these selected farms. The period might be three months or six months or a year; and sometimes a young farmer would work on two, three, or even four such farms before he returned to his own home. I, myself, visited a farm where 70 such student farmers were working. They were not going to college to be trained in theories; they were on this farm to learn how that farmer farmed to make money.

"That farmer kept 250 dairy cows. He also grew a large quantity of sugar beets. I think he had 700 acres in that farm. These young farmers were given instruction in the theories once a week. The practice was not confined to large farms. All over Denmark the best farmers of the locality could have their farms approved and receive these young farmers who came under grants from the Royal Agricultural Society. In general the conditions were that the student farmer must work for three or six months or a year, and at the end of every period write a report to the Society upon what he had seen and done and learned. In a few years the best practice of the best farms became the common knowledge of the farmers of the whole kingdom."

WRITER'S COMMENTS

In the foregoing the following unusual conditions are worthy of note:—

1st. Twenty per cent of the rural adult population has taken a High School training.

2nd. The High Schools are private and residential.

3rd. Young people from 14 to 18 years of age instead of going to school live an outdoor life, at home on the farm.

4th. At the age of 18 they return to school.

S. B. S.

FREE SHORT COURSES IN AGRICULTURE AND FARM HOME

MACDONALD COLLEGE offers the following short courses in 1915:—

1. Lectures on Live Stock, Field Crops, Horticulture, Poultry and Farm Home:—

		1915	
At Magog, Que.,	At Knowlton, Que.,	January	4th.
Ayer's Cliff, Que.,	West Shefford, Que.,	"	5th.
Coaticook, Que.,	Bedford, Que.,	"	6th.
Marbleton, Que.,	Waterville, Que.,	"	7th.
Sawyerville, Que.,	Lennoxville, Que.,	"	8th.
Scotstown, Que.,	.. ..	"	9th.
Hemmingford, Que.,	.. ..	"	11th.
Athelstan, Que.,	Chapeau, Que.,	"	12th.
Kensington, Que.,	Calumet, Que.,	"	13th.
Danville, Que.,	Elmside, Que.,	"	14th.
Richmond, Que.,	Breckenridge, Que.,	"	15th.
South Durham,	.. ..	"	16th.

2. HORTICULTURE—at Macdonald College, February 8th to 12th.

3. POULTRY—at Macdonald College, February 15th to March 6th.

4. DRESSMAKING—at Macdonald College, January 4th to March 19th.

The object of the short courses offered by Macdonald College is to try to reach the farmer and enable him to improve his prospects and to increase his income.

Many farmers and farmers' sons have not the time to take a regular college course lasting two years or more, but there are many who could find time, at the slack season of the year, to take one or more short courses in one or more branches of agriculture. Macdonald College, in order to help such men, offers lectures in stock and seed judging and short courses in horticulture and poultry keeping.

Farmers' wives and daughters are invited to take the lectures in horticulture, poultry and farm home.

Each course will consist of lectures, discussions, illustrations and demonstrations with materials suited to the courses.

Lectures, some illustrated with lantern slides and others with demonstrations, will be held at twenty-one centres in the Province. In the majority of cases these places have not been visited in previous years by a deputation of lecturers. At each place three members, at least, of the College staff will be present representing different lines of work. In ten places meetings for farmers' wives and daughters will be conducted by members of the staff of the School of Household Science.

For the Courses in Horticulture and Poultry to be held at Macdonald College men and women students will be received, but none under 18 years of age. There is no other age limit. A registration fee of $1.00 per course is required in advance.

THE GARDEN AND ORCHARD

FREE SHORT COURSE IN HORTICULTURE

Macdonald College

Feb. 8th to 12th, 1915

A free short course in Horticulture will be held at Macdonald College, Feb. 8th to 12th, inclusive. This course is intended to give practical information on Fruit Growing and Vegetable Gardening to business men and farmers who have not the time to devote to a longer course. In addition to the regular lectures considerable time will be given to a discussion of the different subjects and the answering of questions.

Such subjects as the following will be taken up:

Fruit-Growing:—

The Apple Orchard, Planting, Management, Renovation, Pruning, Spraying, Box and Barrel Packing demonstrated, and the Marketing of the fruit; Plum and Cherry Culture; Strawberry, Raspberry and Current Culture.

Vegetable Gardening:—

Potato Culture; Onion Culture; Peas and Beans; Up-to-date Methods of Gardening; Ten Acres of Intensive Gardening with Vegetables and Small Fruits; and Gardening, Illustrated.

General:—

Improvement of the Home Surroundings; Fungus Diseases of Fruits and Vegetables; Insects and How to Combat them; and Demonstrations in the making the Lime-Sulphur Wash and the Bordeaux Mixture.

The greenhouses will be visited from time to time where many different flowers and vegetables can be seen and studied. The course will be made as practical as possible and many subjects will be illustrated by actual demonstrations.

The course is open to all, both men and women. Board and rooms can be secured near the College at very reasonable rates. Remember the date, Feb. 8th to 12th inclusive.

For further particulars address:

Dr. F. C. HARRISON, Principal or
T. G. BUNTING, Professor of
Horticulture,
Macdonald College

The special course in Dressmaking and Needlework, offered for the first time, will be given by the School of Household Science. The greater part of the time will be devoted to the work in dressmaking but millinery, home decoration, laundry work (including dry cleaning and renovating) and textiles will be given. For this course the tuition fee is:

To farmers' daughters of the Province of Quebec- Free;

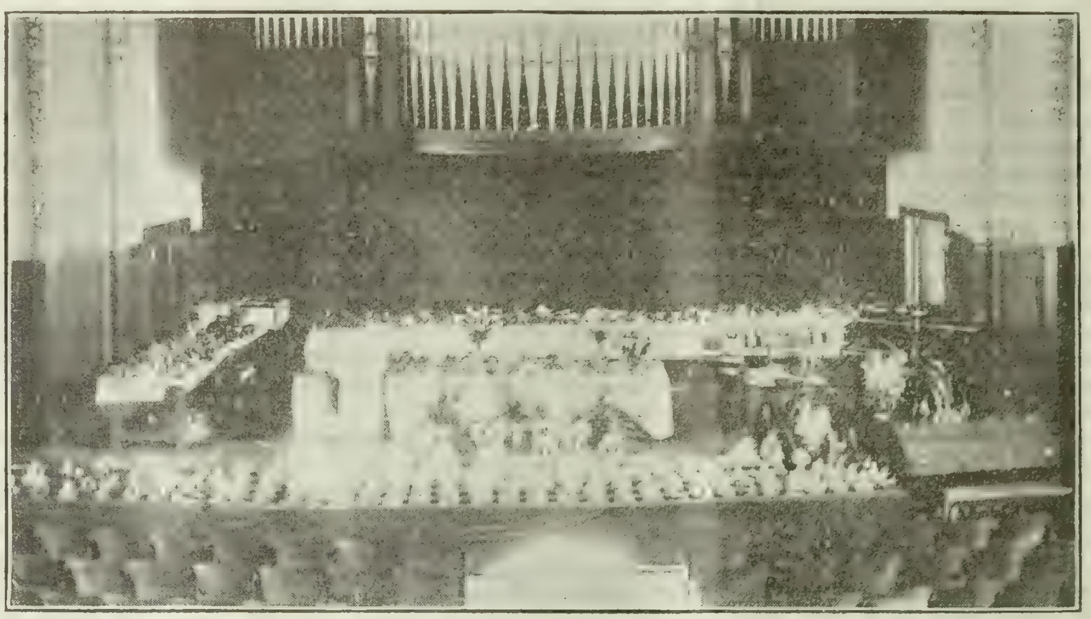
Other residents of Canada, $25.00;

Laboratory fee, $5.00, and board at $4.00 per week.

There are no examinations for entrance or at the end of the courses.

Write for illustrated bulletin to

The Principal,
Macdonald College, Que.



The Exhibition of Fruit held in the Assembly Hall of Macdonald College. Prof. Macoun's Collection of Seedling fruits occupies the front table.

ANNUAL WINTER MEETING OF THE QUEBEC POMOLOGICAL SOCIETY

Held at Macdonald College, December 2-3; Good Attendance; Market End of Fruit-growing emphasized; Exhibition highly educational

THE regular annual winter meeting of the Quebec Pomological and Fruit-Growing Society, held at Macdonald College on December 2-3, was a successful one in every respect. The attendance was large and was representative of the fruit interests of the province as well as of the Dominion. The questions under discussion emphasized the business or market end of fruit-growing rather than the production end, since the fruit-growers found some difficulty in marketing the large crop of fruit this year on account of war conditions.

The following growers were present:— Professor T. G. Bunting, President; Messrs R. A. Rousseau, Peter Reid, Secretary; Rev. Father Leopold, of La Trappe, G. B. Edwards, of Covey Hill, R. Brodie, of Westmount, Rev. H. A. Dickson, of Rectory Hill, A. D. Verreault, F. A. Gosselin, N. E. Jack, J. M. Fisk, C. E. Slack, Charles Fisk, J. Crossfield, E. A. Buzzell, of Abbottsford; A. A. Johnson, G. R. Hitchcock, A. Lalonde, H. Cloutier, A. Letourneau, A. Raymond, K. I. Ross, A. J. Dawes, of Lachine, A. Ferguson, Dr. Harrison, Professor Lochhead, Dr. Hamilton, A. H. MacLennan, A. C. Gorham, W. P. Fraser, Professor W. T. Macoun and M. B. Davis, of the C.E.F., D. Johnson, F. H. Grindley and C. W. Baxter, of the Fruit Commissioner's Branch; Mr. D. J. Wood and Mr. Lavoie, of the Fruit Dept. of Quebec, and many visitors and students.

Professor Bunting presided very acceptably at all the sessions. His presidential address, printed in the last number of the Journal of Agriculture, was well received and struck the dominant note running through the entire proceedings.

BUSINESS MEETING

A decidedly prosperous state of affairs was shown at the annual business meeting. It was shown by Secretary Peter Reid that the membership of the society was well maintained, while the interest in its work, and especially in the publica-

Entrance to the Macdonald College grounds, which was much admired by the visiting fruit-growers.

tions of its deliberations, was growing. This was in part caused by the increased interest in orchard work, due to the growing realization that in its orchards Quebec possesses a very valuable asset, and in part due to the energetic work of the Hon. Mr. Caron, the provincial Minister of Agriculture. The officers of the association also expressed their thanks for the manner in which the Hon. G. E. Foster, Minister of Trade and Commerce, had increased the use of apples in Canada by the recent advertising campaign, which had produced excellent results.

MARKETING OF THE APPLE CROP

After an address of welcome from Dr. Harrison, Principal of Macdonald College, Mr. C. W. Baxter, of the Fruit Inspection Staff, gave an address on "The Distribution of Fruits," in which he pointed out the enormous difference between the price received by the producers and the money paid by the consumers, and advocated more organization and cooperation amongst the growers to overcome this. As an instance of this Mr. Baxter quoted a case where a grower received 50 cents for a barrel of apples, and the ultimate consumer paid $5.50 for it. The trouble was that some retailers who could not make the profits they wanted on other articles made it up on apples and similar goods, demanding as high as 300 per cent. profit —and getting it.

Inferior fruit and exorbitant retail prices are obstacles in the way of enlarging the home market. Better organization was necessary to enable the producer to get a larger share of the consumer's dollar. The growers of the northwestern states have already accomplished a great deal in controlling the distribution of their fruit, and thus regulating prices. Nova Scotia and British Columbia growers are falling in line.

"There is," said Mr. Baxter, "no fruit which offers more speculative inducements than the apple. In this respect, there is a striking contrast to oranges and bananas, which are the strongest rivals in the market. In too many cases the profit on apples is exorbitant and much in excess of many of the articles that the retailer sells. Under the present system, however, the retailer controls the situation."

Father Leopold, of La Trappe, followed, in a similar strain. He pointed out the great demand for Quebec Province's Fameuse and MacIntosh Reds, and the difficulty in marketing them, owing to the exorbitant profits demanded by the retailers. This, he said, was largely due to the practice of selling by the dozen. This resulted in the well-to-do man who bought by the barrel or box getting his money's worth, while the poor man, who had to buy by the dozen, was mulcted, so that to him Canadian apples were an expensive luxury.

Father Leopold stated that personally he had no difficulty in selling first-class Fameuse and McIntosh, though he found that the lower grades were only too plentiful on the market. Both speakers agreed that the remedy for the present state of affairs was better organization of the producers and the adoption of manufacturers' methods, whereby there would be even distribution and a certain amount of control of retail prices.

Better systems of marketing were discussed by F. H. Grindley, of the Fruit Division, Ottawa. (See full address in another column). He told of shipping several carloads of apples in bulk from Western Ontario to Ottawa. By this means, the expenses had been reduced to a minimum, and it was possible to deliver good fruit to the consumers' homes at about sixty cents a bushel. Had it not been for this organized effort the apples would have wasted on the farms, and the poorer people in the city had no choice but to buy from the retailer at double the price.

Several growers from the Abbotsford district told of selling second and third class apples to speculators who shipped in bulk to towns on the lower St. Lawrence. They congratulated themselves on having this easy and profitable outlet for their crop.

Professor Bunting thought that if the growers had not this easy means for disposal of inferior grades, they would be forced to take greater care and thus get a larger proportion of No. 1.

Two main points were emphasized in the course of these valuable discussions on better marketing of apples. In order to secure better results it was necessary to have more cooperation between the fruit growers, both with regard to marketing their products, and the purchase of supplies; that since Quebec province could grow the finest Fameuse and MacIntosh Red apples in the world, apple growers in this province should not waste efforts on less profitable varieties Several speakers urged this point, showing that while for the common run of apples the market this year had been glutted there had been a very strong demand for the two special Quebec varieties, despite the fact that there had been a very large crop. It was further shown that this demand came from home points to such an extent that very few of these varieties were exported, since the demand here more than exhausted the supply. People in other countries had to content themselves with less choice varieties.

Careless packing, said Father Leopold, had more to do with keeping down prices this year than the war conditions. Attractive box packing may entail only a few cents more expense, while the extra price secured is in many cases a dollar. There is an advantage to the trade in selling by the box, for the reason that consumers will eat more than when sold by the dozen. Under the present system the retailer wants 50 to 100 per cent profit and makes up on apples what he loses on other goods.

Mr. Robt. Brodie estimated that two-thirds of the apple crop on the island of Montreal was shaken from the trees and marketed loose in boxes. He had noted the appearance this season of bushel baskets in the stores which permitted the buyer to see the quality and tend to lessen the expense of packing.

APPLE GROWING

Mr. W. T. Macoun gave a review of apple growing in the Province of Quebec from the time of the first plantings which were probably made early in the seventeenth century. The Fameuse, which originated shortly after, retains its popularity in spite of numerous recent introductions. Varieties like the Ben Davis, Golden Russet and Astrakan are not long-lived in the severe climate of the St. Lawrence Valley.

CO-OPERATION

Mr. D. Johnson, Dominion Fruit Commissioner, spoke on the need for co-operation, giving instances of their success in Ontario. Ten years ago he had addressed a meeting of farmers at Simcoe, advising them to produce better fruit. The growers were then discouraged over failure to find a market. An organization was, however, effected, with the result that the highest market prices were secured and the yield improved in quantity and quality. From 50,000 to 60,000 barrels are shipped from this district every year. In the State of Washington 650,000 acres have been planted to orchard, a large proportion of which is now coming into bearing. There will be little prospect of selling the output except through the powerful organization which they have formed. This danger of overproduction exists in Canada and the individual will be unable to secure a purchaser. Co-operative selling will become a necessity.

The power of the press was recognized by Mr. Johnson, and he hoped by means of the advertising campaign to increase the home consumption. This fall the number of inquiries received daily at Ottawa reached the thousand mark, all due to the publicity given in the papers.

INTERCROPPING THE YOUNG ORCHARD

The economy of cropping between the rows of trees in a young orchard was discussed by Professor MacLennan, of Macdonald College. Vegetables such as cabbage or potatoes bring good returns, while the cultivation necessary for them also benefitted the trees. Chickens might be allowed to run freely without risk of injury. An increasing number of small holders in Ontario combined such crops with satisfactory results.

EXPERIENCES WITH FIRE POTS

Mr. M. B. Davis, Ottawa, gave a paper on experiences with fire pots in orchards to ward off spring frosts. These were a kinds of pail, loaded with fuel oil, about 100 to the acre, the result of their burning being to prevent damage to the buds and blossoms at critical periods. This subject caused much discussion, the general idea being that it was a good thing, especially as the cost of such artificial heating was insignificant compared with the damage that might be done to a promising crop by an ill-timed frost.

At a cost of $1.50 to $2.50 per hour, the temperature over an acre of orchard could be raised several degrees and danger avoided.

OTHER MATTERS TREATED

Mr. G. E. MacIntosh of Forest, Ont., gave an interesting address on "Transportation of Fruit", Mr. Newton of Montreal discussed "Commercial Lime Sulphur and Arsenates of Lead", and Mr. D. J. Wood of Quebec read a paper on "Preserving our Surplus Fruit," discussing the importance of disposing of surplus fruit in a year like this when so much went to waste. He emphasied cooperation in this matter if the best results were to be obtained. Mr. Wood had an interesting exhibit of canned fruit which added to the value of the exhibition as a whole.

PRIZES AWARDED AT FRUIT EXHIBITION

The exhibition of fruit, although not a large one, was along educational lines, showing methods of box and barrel packing, specimens of the chief varieties of apples, and a splendid exhibit of seedling apples grown at the C.E.F., Ottawa. Mr. Wood had a fine exhibit of canned fruits.

At the exhibition held during the meeting, the following prizes were awarded:

Best condition—1, A. A. Johnson, Sweetsburg; 2, Chas. E. Slack, Abbotsford.

Best twelve varieties—1, Chas. E. Slack; 2, A. A. Johnson; 3, A. D. Verreault, Village des Aulnaies.

Six export varieties—1, Chas. E. Slack; 2, A. A. Johnson; 3, A. D. Verreault.

Alexander—1, Chas. E. Slack; 2, A. A. Johnson; 3, A. Lalonde, Isle Perrot.

Fameuse—1, Chas. E. Slack; 2, A. A. Johnson; 3, Rev. H. A. Dickson, Rectory Hill.

Wealthy—1, Rev. H. A. Dickson; 2, A. A. Johnson; 3, Chas. E. Slack.

Pewalkee—1, A. A. Johnson; 2, Peter Reid, Chateauguay Basin.

Canada Baldwin—1, Chas. E. Slack; 2, Peter Reid; 3, A. A. Johnson.

Canada Red—1, A. A. Johnson; 2, Peter Reid; 3, G. P. Hitchcook, Massiwippi.

Northern Spy—1, A. A. Johnson; 2, Chas. E. Slack; 3, A. D. Verreault.

Blue Pearmain—1, C. E. Slack; 2, A. A. Johnson.

Bethel—1, G. P. Hitchcock; 2, C. E. Slack.

MacIntosh Red—1, C. E. Slack; 2, A. A. Johnson; 3, Peter Reid.

Wolfe River—1, A. A. Johnson; 2, C. E. Slack.

Golden Russet—1, A. A. Johnson; 2, C. E. Slack; 3, Peter Reid.

Scott's Winter—1, C. E. Slack; 2, A. A. Johnson; 3, Rev. H. A. Dickson.

Baxter—1, A. A. Johnson; 2, C. E. Slack; 3, Antoine Lalonde.

A. O. V.—1, Antoine Lalonde; 2, F. X. Gosselin; 3, G. P. Hitchcock.

Class V, Seedling—1, Peter Reid; 2, Rev. H. A. Dickson; 3, A. A. Johnson.

Class VI, Barrel Fameuse—1, C. E. Slack; 2, A. A. Johnson.

Box Fameuse—1, Rev. Father Leopold; 2, A. A. Johnson; 3, C. E. Slack.

Class VII, Barrel MacIntosh—1, C. E. Slack; 2, A. A. Johnson.

Box MacIntosh—1, Rev. Father Leopold; 2, C. E. Slack; 3, Peter Reid.

PROPOSED FRUIT, VEGETABLE, FLOWER AND HONEY SHOW

Further efforts were also made to initiate co-operative work with other societies, so as to secure the holding of a combined exhibition in Montreal, and also annual meetings where each society could conduct its own work and hold joint meetings, where general matters could be discussed.

This was presented in a motion by Dr. Harrison, Principal of Macdonald College, and the Rev. H. A. Dickson—"That the executive be instructed to ascertain the possibility of bringing about co-operation with the Horticultural, Florists' and Vegetable Growers' Society of the province, with the object of holding a provincial flower, fruit, vegetable and honey show in the city of Montreal, similar to that held in Toronto."

This proposition was strongly approved, and the executive instructed to take the necessary steps and report at next meeting.

Resolutions were adopted urging upon the Dominion Government the necessity for better transportation facilities for fruit; thanking the Provincial Minister of Agriculture for his active aid to the society in its work; thanking Dr. Harrison and the Macdonald College staff for their hospitality, and especially thanking the Hon. Martin Burrell, Dominion Minister of Agriculture, for his appointing Mr. Donald Johnson in charge of a separate fruit branch of that department. A resolution of regret was also passed at the death of the late Mr. Alexander McNeill and the late Dr. Wm. Saunders.

OFFICERS FOR 1915

The following officers were elected: President, R. A. Rousseau, Acton Vale; vice-president, Prof. W. Lochhead, Macdonald College; secretary-treasurer, Peter Reid, Chateauguay Basin; directors, G. B. Edwards, Covey Hill; C. E. Slack, Abbotsford; G. P. Hitchcock, Massiwippi; Rev. H. A. Dickson, Rectory Hill, T. A. Raymond, St. Valier; A. Roy, L'Ange Gardien; F. X. Gosselin, Ste. Famille, Rev. Father Leopold, La Trappe, and Robert Brodie, Montreal.

PUBLIC HANDLING OF FRUIT

By F. H. Grindley, B.S.A., Fruit Division, Ottawa

(An address to the Quebec Pomological and Fruit Growing Society at Macdonald College, December 1914.)

ONE of the main problems before the trade today is that of eliminating some of the expenses which are incurred during the various stages of marketing.

The question has been threshed and rethreshed at all manner of meetings and in all parts of the country; and today we are no nearer or very little nearer, a solution than we were. We still have the middlemen and their supposed profits, we still have the high prices to the consumer and the comparatively low price to the grower. I do not wish to condemn the middleman, for after all he has his place and is largely responsible for the distribution of our fruits in the markets. He is useful. We would be in a sorry plight without him. And listen: few wholesalers are growing rich, few retailers are making the outlandish profits with which we have been wont to credit them.

Why, then, does fruit cost so much? Simply because our system of marketing is wrong, and wrong because it is too expensive. There are consumers who are willing to pay the ordinary market price of fruit, who, in fact, give little or no regard to its cost. That class of people will always exist, and we need now give them no special concern, for they are not the consumers to whom I intend to refer. The class to which we must give our attention is the poorer class, the labouring class, the average man on the street, the consumer who is willing to do his share in bringing about a more desirable condition of affairs.

These people are not in a position to pay high prices for fruit. Nor have they been able to buy fruit this year when it has been cheaper than usual, for the simple reason that dollars have been as scarce as the proverbial hen's teeth.

The gist of the matter is this: these consumers and the producers must, between themselves, find some means of getting closer together and removing unnecessary expenses. If the consumer wants his fruit in barrels he can have it in barrels. If he wants it in boxes, the producer must put it up in boxes. Wherever there is a demand, that demand will be supplied, must be supplied, if the supply is available.

But the *grower* cannot do everything. He has done much by the organization of co-operative associations, by giving the public a uniform pack and by giving the members of these associations a better price than their independent neighbor. The *consumer* is still acting as an individual, is still paying his $4.00 or $5.00 per barrel to the retailer, who in turn is supplied by the wholesaler, and so on back to the producer. And here is this same consumer putting up his wail against existing conditions. If he wants cheap apples he can get them. The average price this year to the grower was 75c. a barrel on the tree for No. 1's, 2's, 3's, and practically the same amount of money will pick and pack and market the fruit within a reasonable distance. An additional 45c. or 50c. must be allowed for the barrel, if shipped in barrels.

But the consumers must organize just as the growers are already organizing. Unless they do so they must pay what the trade demands. The wholesaler is making no outrageous profits on his turn-over, the retailer has his expenses to meet, his delivery wagons to keep up, his employees to pay. Let the consumers get together, organize themselves into associations with executive officers capable and willing and broad-minded enough to make some effort in their own interest. Then they can get apples in any conceivable manner. They can get them with the city crest printed on them if they want to. The whole problem is in the hands of the consumers themselves, with the co-operation of the producers.

This does not mean that the middlemen will be boycotted. They will still have their legitimate field in which to co-operate. It simply means that more fruit, much more fruit, will be consumed. The threatening danger of over-production will be lessened. People will be able to buy apples who have hitherto regarded them as a luxury beyond their reach. Others may have been securing their supply of fruit from hucksters and pedlers at 15c. a gallon in small quantities. But that is at least $3.00 a barrel. Some of these pedlers, it is true, may be put out of business. But what of that? The cities would be better off without them, and the consumers to whom they cater will get equally good fruit for half the price.

It is just possible that some critic may say: "These things are all well and good in theory. Printed on paper the scheme appears excellent. Others before you have told the consumers to get nearer to the producer. But we are from Missouri and you must show us how". Very well.

This year there was a great deal of fruit which went to waste, particularly in Western Ontario. This was because the demand was largely lessened, the export market for early and fall varieties was cut off, and there were few itinerant buyers in the field. Be the reasons what they may, fruit was never harvested in some orchards and was frozen on the tree.

Realizing the situation the City Council of Ottawa tried an experiment with apples shipped in bulk, to supply the poorer classes in that city. Two cars of mixed varieties—Baldwins, Russets, Greenings and Spies—have been brought into Ottawa. The fruit was of good quality, tree run, arrived at destination in first class condition, and was delivered at the doors of the consumers in bags at $1.30 for 140 pounds, which is equal to the contents of one barrel. So great was the demand for this class of fruit that a single advertisement in the Ottawa papers was sufficient to sell a whole car, and one enthusiast went so far as to say that fifty cars could have been sold in a similar way in Ottawa alone.

The results of that experiment are suggestive. In every large town and city there are public institutions, charitable organizations whose duty it is to look after the needs of the people. Through them much good can be done, if someone will take the initiative and point out to these bodies the benefits of such a scheme. Or, as perhaps a better alternative, it would be feasible for the co-operative associations at the producers' end to have representatives in certain cities to supervise the distribution of their crop. At any rate, we in Ottawa are satisfied with what the City Council has done, those in the Council who organized the work are satisfied, and certainly those who were fortunate enough to secure some of the fruit were satisfied.

I fully realize that I have been talking of the poorer class of consumer, and of apples shipped in bulk form. I know perfectly well that this has been an exceptional year and that had apples not been shipped in bulk they would probably never have been shipped at all. I admit all that. But I still maintain that the principle is right, that if you can sell apples direct to the consumer in bulk you can sell them in other ways without going through all the ordinary channels of commercial marketing. What can be done with loose fruit can be done with barrels, with boxes, with cartons or with what you will. The additional cost will be the cost of packing and packages, and nothing more.

One other matter bearing upon this subject has recently come to our attention in Ottawa and is worthy of some comment. Passing among the audience now are four photographs taken in the North Vancouver Municipal Market which was opened about three weeks ago. The enterprise is being managed by the Markets Committee of the City Council. The market is opened every Saturday at noon when for two hours the public are able to make any purchases they desire from the different stands. After two o'clock the produce is sold by auction. There are no commissions or charges of any sort while the matter is in an experimental stage, except a flat rate of 10c. for delivery in the city. The idea is held that the establishment of this market will encourage the production of vegetables, etc., on the vacant land in the vicinity of Vancouver.

This is a scheme of selling fruit and produce direct to the consumer and it will be interesting to follow the results which are obtained. At any rate, it is worthy of mention in this paper as showing the enterprise of the Vancouver people.

And now let me try to refute one more possible criticism. If the whole fruit industry attempts to market direct to the consumer, if a demand is created in the cities and towns for cheap apples, if all these efforts are made to lessen the price of fruit, where is the producer's profit, where the need for co-operative fruit growers' associations, where the necessity for careful grading and packing? Anyone who argues along that line has given no attention to what I have already said. What I have briefly suggested should in no way interfere with the good work which is being done along co-operative lines. The growers must still cater to the needs of the better classes in our own markets, they must continue to feed the export market with high class fruit and those new and wider markets which are even now being exploited. All this must be done, but let us consider, too, the poorer classes, let us interfere with the pedler trade and give their customers better fruit at more reasonable figures.

THE FARM AND FARM CROPS

FIFTH PROVINCIAL EXHIBITION OF SEED GRAIN

January 27th and 28th 1915

THE fifth provincial exhibition of seed grain will be held at Quebec, on the 27th and 28th January, 1915, at the Parliament Buildings, Library room,(new building), under the auspices of the Department of Agriculture of Quebec, with the cooperation of the Federal Department of Agriculture of Ottawa.

During the exhibition there will be a sale and exchange of seed grain.

The farmers who visit this Exhibition and attend the lectures will be convinced that by selecting seed and adopting a good system of culture, grain of the very best quality can be grown in the Province of Quebec.

PROGRAM

Wednesday, January 27th, 1915

From 9 A. M. to 5 P. M.—Judging seeds:
Judges: Mr. J.-A. Simard,
Inspector of seed grains, Ottawa.
Robert Summerby, B.S.A., from Macdonald College.
Louis Lavallée, Farmer, of St. Guillaume d'Upton, Yamaska.

8 P. M.—Convention of the members of the Canadian Seed Growers' Association, under the presidency of the Honorable Minister of Agriculture of Quebec. All farmers are invited to attend this convention.—Lectures on the production and the selection of seed grain.—Clover Cultivation.—Discussion.

Thursday, January 28th, 1915.

9 A. M.—Competition in judging seed grain, divided into two classes:—

First Class:—The competitors in this class must be at least 16 years old and not more than 25 years old.—The following prizes are awarded:—

1st prize	$8.00
2nd prize	6.00
3rd prize	4.00
4th prize	2.00
5th prize	1.00

Second Class:—All farmers more than 25 years old are eligible to compete in this second class.—(Same prizes as those offered for the first class).

The judges appointed to determine the merit of the competitors in these two classes will give, before the opening of the competition, the conditions to be observed and the instructions to be followed.

10 A. M.—Auction sale of seeds.

5 P. M.—Closing of the fair.

We would call the attention of the farmers to the large quantity of choice seed which will be offered for sale at this exhibition.

The exhibition hall will be opened from 9 o'clock in the morning until 5 o'clock in the afternoon, and the public is invited to attend and examine the exhibits. Entrance will be free.

As long as the grower gets a fair price for his product, a price that will pay him for his fruit and for his labours, it matters little to him what course it follows after it leaves the orchard.

We are told that even now there is a danger of over-production in Canada, that unless new markets are found, conditions will rapidly become more and more unsatisfactory. Make an effort, then, to increase consumption at home by selling some of our fruit through economical channels, and by catering to a class of people who have either considered fruit as a luxury when they have bought it, or who have never been able to buy it at all. That is the only thought which this paper is intended to leave with you, and I can only hope that some more extensive and organized effort will be taken along that line.

MAPLE SUGAR MAKERS' MEETING

THE third annual meeting of the Pure Maple Sugar and Syrup Co-operative Agricultural Association will be held in Beauceville, Que., at the Town Hall on Tuesday January 12th, at 2 p.m. and 7 p.m. Addresses of interest to the sugar maker will be delivered, mainly in French.

The Annual reports of the Society are published both in English and in French. The report of last year's annual meeting, held in Huntingdon, contains a number of valuable papers. Worthy of special mention is the address of Mr. C. O. Ormsbee, of Montpelier, Vt., the delegate of the Vermont Sugar Makers' Association. Mr. Ormsbee's address is a masterly treatment of some of the practical aspects of the maple industry. Membership in the Association, costing one dollar a year, entitles one to a copy of this report. The Association, which has a membership of 336, is a live and influential one and it is to the interest of every maker of syrup or sugar to lend it his support. The Secretary-Treasurer is Mr. Joseph H. Lefebvre, Waterloo, Que.,

THE RENOVATION OF NEGLECTED ORCHARDS

BULLETIN Number 79 of the Experimental Farm is entitled "Renovation of the Neglected Orchard". It has been prepared by M. B. Davis, B.S.A., Assistant to the Dominion Horticulturist. Special attention is given to the following practices: Heading back old trees; thinning, scraping, cleaning and tree surgery; cultivation and cover crops; systems of cultivation; fertilization; spraying and thinning fruit. The bulletin is generously illustrated. It has been prepared with a view of showing how, by a reasonable amount of labour and care, profitless old orchards, which are a menace to the local orchard industry, may be made a remunerative part of the farm and a credit to the neighbourhood. Copies of this bulletin are available at the Publications Branch of the Department of Agriculture, Ottawa.

REPORTS RECEIVED

1. The Canadian Record of Performance for Pure Bred Dairy Cattle, Report No. 6, Department of Agriculture, Ottawa. Branch of Live Stock Commissioner.

2. Ontario Agricultural and Experimental Union 1913 (35th Annual Report). Ontario Department of Agriculture, Toronto.

Contains results of co-operative experiments in agriculture, apiculture, forestry and weed eradication, upon results obtained with legume bacteria and upon work in the rural schools. There are special papers on "Disposal of Screenings at Terminal Elevators" by J. R. Dymond, "Crop Rotation" by H. A. Morgan, the "Dairy Shorthorn" by Professor G. E. Day; and "Co-operation in Agriculture", by C. F. Bailey.

ALFALFA DEMONSTRATION PLOTS IN QUEBEC

THREE years ago the Conservation Commission started work with a view to encouraging the more general growing of alfalfa in Quebec. A few plots were set out in several widely separated sections, representing large areas of the province namely in L'Assomption County, Huntingdon County and Brome county.

Ever since this work was commenced climatic conditions have been anything but favorable for testing the real value of a crop under average conditions. In each of the summers when the alfalfa was under test we have had an extremely dry period lasting for many weeks; in the winter of 1912 and '13, the most severe winter killing of alfalfas and clovers that we have had for many years was experienced. In spite of these extraordinary trying conditions there is strong evidence that alfalfa can be grown successfully over a large area of Quebec and should, we think, be given a thorough trial where soil conditions and other natural factors are not obviously against its growth.

WORK IN 1914

Practically all alfalfa and clover in the province came through the winter of 1913 and '14 in a seriously weakened condition due to the late winter and early spring frosts. This followed by a severe drought lasting until late midsummer made it that the conditions for the growth of these crops were the worst that we have had in recent years. This is also evidenced by the low yield of hay in the province.

L'ASSOMPTION COUNTY

Two fields were under test in this section in 1914. One of these did not come through the winter with a sufficient stand to warrant being left for hay, consequently it was plowed up. Judging from the condition of the plants as they entered the winter, and as this field behaved very similarly two years ago, it is probable that soil conditions were partly, if not largely, responsible for the loss of crop. The other field in this section came through the winter in a weakened condition, but with a complete stand and soon recovered its vigor. Three excellent cuttings were obtained, each of which would surpass the average yield of hay in the vicinity. The owner of this block of alfalfa is so well satisfied that he intends to put in a much larger acreage next year, and is even contemplating sowing some in rows for seed.

The cut shows the third crop in early September. A group of neighbors may be noticed to be standing kneedeep in the alfalfa.

BROME COUNTY

In this county three fields were originally set out with this work. On all these the growth of sheep sorrel, sourgrass, and other plants that indicate acidity were quite abundant, in spite of the fact that an application of lime was given at the time of seeding. It seems probable that a further application will be necessary for the most successful alfalfa culture. Two of these fields produced very little growth and were plowed up after the first cutting. The third field, however, gave a high yield from the first cutting as compared with other hay crops and also gave a good second growth in spite of the extraordinary dry conditions prevailing at that time. On account of the prevalence of the above mentioned weeds, however, it was considered wise to plow it and prepare for reseeding.

Work on one of the first mentioned fields has been discontinued on account of having an extremely open and loose subsoil. The other two are being prepared for reseeding in 1915 when a further application of lime will be given with the hope of rendering them fit for producing alfalfa quite successfully.

HUNTINGDON COUNTY

By far the greatest success has been had in this county as compared with others so far tried. Of three fields originally set out all were sufficiently

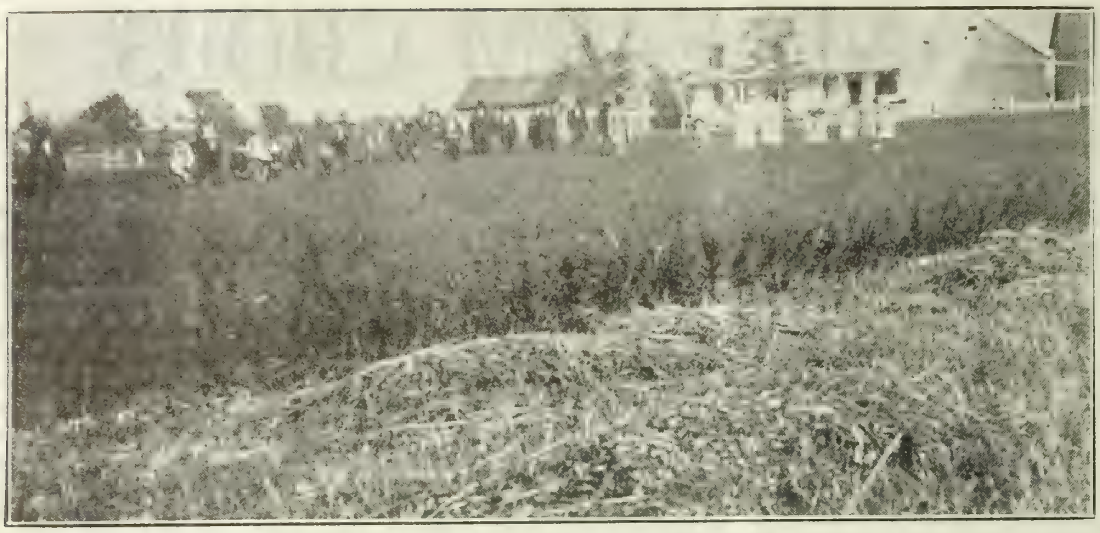


Photo of Alfalfa Plot on the farm of Mr. Marsellais, L'Assomption Co., Que.

good to outyield other haycrops of the vicinity. Three good cuts were obtained from two of these fields and two were taken from the remaining one. There is no doubt but what alfalfa can be grown in this section of the province without any difficulty providing that drainage and good cultural conditions are given.

CONCLUSION

While it is true that there have been some failures in this work yet these have been largely due to extraordinary climatic conditions and to soil defects that can be remedied. The fact that most of the plots outyielded by far the hay crop of their immediate vicinity, under such trying conditions as we have had, furnishes still stronger evidence that alfalfa can be grown successfully over large areas of Quebec.

R. SUMMERBY,

Macdonald College

FARM WEEDS

(The December number of the Journal of Agriculture discussed the "Causes of Prevalence of Weeds" in Quebec. Members of Farmers' Clubs who are interested in the question of weeds should re-read the article on pp. 135-136 *Editor.)*

Article II

KINDS OF WEEDS

EVERY person knows that all weeds are not equally noxious or harmful. Some grow in profusion and interfere greatly with both the growing and the handling of crops, while others multiply slowly and do not trouble the crop to any extent.. Some grow only where there is rich soil and where every condition is favourable, while others are able to grow even under most unfavourable conditions. The weeds that frequent roadsides are very hardy, as they manage to thrive in spite of drought, dust, grazing animals and the competition of the other plants. When these weeds are left uncut and are allowed to enter cultivated fields where conditions are much more congenial, they develop rapidly and become troublesome. Such weeds are ox-eye daisy, couch grass, thistle, chicory, devil's paint brush, wild carrot, yarrow, sorrel, knapweed and others.

Lamb's quarters, a common annual.

Perennial sow-thistle a bad creeping perennial, with its seed.

Annuals, biennials and perennials.—It will be observed that these hardy successful weeds are mainly *perennials,* with either thick deep roots or creeping underground stems. These plants keep growing year after year, and are often most difficult to eradicate. Along with these will be found some *biennials,* like wild carrot, wild parsnip and burdock, which die after producing seed in the second year.

Perhaps the majority of the weeds that spring up in our cultivated fields are *annuals* which live for only a year. These are often troublesome and injurious but they are seldom difficult to eradicate. Among the most common annual weeds are lamb's quarters, pigweed, annual sow thistle, mustard, purslane, chickweed, ragweed, Russian thistle, smartweed or lady's thumb, hemp nettle, knotweed, wild oats, green foxtail, barnyard grass and old witch grass.

Certain weeds are called *winter annuals,* because the seedlings spring up in the fall and complete their growth the following summer. Penny cress, pepper grass, false flax, shepherd's purse, chess, corn cockle, and field gromwell are examples of this class.

In the control of annuals it is evident that if seeding is prevented the plants are absolutely controlled and exterminated.

Soil indicators. Some weeds occur only on certain kinds of soils, hence are known as *soil indicators.* Field horse-tail occurs only on sandy or gravelly undrained moist soil; sheep or field sorrel on rather poor acid soils; lamb's quarters, pigweed, purslane and others of that ilk on rich loamy soils; poverty weed on poor sandy soils, and other weeds that might be mentioned.

Habits of growth. — There is also much difference in the habits of growth of weeds. Most annuals have a shallow much-branched root-system and produce a large number of seeds. In some cases the stems are *erect* as with mustard, in others they are *prostrate* as with chickweeds and knotgrass. Most biennials are deep-rooted. Among perennials there are *erect* forms and *creeping root-stock* forms. The latter may be divided again into the *shallow-rooted,* such as couch grass, and the *deep-rooted* such as Canada thistle, perennial sow thistle and bindweed. On the underground root-stocks are dormant buds which send up new shoots under favourable conditions of warmth and moisture or when the root-stocks are severed from the main plant by cultivation. It is obvious, then, that creeping perennials are the most difficult to eradicate.

Shepherd's Purse—a winter annual.

Wild carrot, a noxious biennial with a deep tap root.

Weeds and Crops. In old meadows and grasslands annuals are practically absent for the reason that they are crowded out by other and more vigorous plants. However, they follow cultivated crops where every plant has an equal chance. Their seedlings then spring up rapidly and often hold their own with the crop during the growing season.

The perennials that follow cultivated crops are

Rib-grass or narrow-leaved Plantain, a tap-rooted perennial, with its seed.

mostly of the kind with creeping underground rootstocks, where parts have been broken off by the cultivator and carried over the fields. Tap-rooted perennials and biennials furnish most of the dooryard weeds, such as plantain, heal-all, mallow, dock and burdock.

Distribution. Many weeds are scattered by means of their seeds which are sometimes blown from field to field and from farm to farm. Some seeds are distributed through the agency of animals. Their fruits have hooks and they cling readily to the hair or wool. Some weeds, like old witch grass and Russian thistle, break off near the ground and the seeds are scattered as the plants tumble over the hard ground.

Some of the worst weeds have been introduced and distributed through the medium of commercial seeds, such as clover, grasses and cereals, exposed for sale in seed stores.

A few weeds are distributed through the breaking off of underground portions by harrows and plows. This method occurs with Canada thistle, perennial sow thistle, couch grass and bindweed.

(To be continued).

W. L.

THE WAR, EDUCATION AND AGRICULTURE IN THE PROVINCE OF QUEBEC

By Dr. F. C. Harrison, Principal of Macdonald College

(An address given before the Canadian Club of Quebec, Dec. 9th, 1914.)

WITH your thoughts these days constantly turning towards the scenes of hostilities, your imagination vainly endeavoring to fill in the details of the stories of heroism and suffering told in the curt official phrases, it is somewhat difficult to interest any audience in agriculture and education.

Those who remain at home desire to do something to help those at the front, and the more active such help the more pleasing it is apt to be —to feel and realise that they also serve who stay at home and work, and this sentiment directed along the lines of agriculture is the subject on which your honored Secretary has asked me to address you.

INDUSTRY DEPENDS ON AGRICULTURE

In time of war industry is largely dependent on the buying power of agriculture; therefore the productive power of agriculture is a national question. In addition war demands provisions, either the raw or manufactured products of our farms — wheat, oats, hay, and meat, cheese, sugar, wool and leather. To what extent can Canada, and our own Province especially, supply these? Quebec grows only a million bushels of wheat, not sufficient for its own people. 39,000,000 bushels of oats are grown, but this amount is not sufficient to give the 370,000 horses in the province of Quebec 10 lbs of oats a day, and does not take into account the oat feed given to cattle, sheep and hogs. Hay constitutes our chief agricultural wealth and accounts for more than 53 per cent. of the total value of the farm products of the province. The war value of this commodity is not as great as that of the grains, as most armies rely on the country they are campaining in for rough fodder and the bulky nature of the material makes transport difficult. Nevertheless, its importance is great, in that it serves as food for stock and can thus be turned into meat, butter and cheese.

We cannot compete with the West in wheat and oat growing but we can grow those crops that are advantageous for the feeding of animals and sell the manufactured product of our farms, and thus obtain better prices and at the same time increase the fertility of the land.

It is along these lines that Quebec will find the best outlet for her war commodities, and under the present war conditions we should follow the impetus given by the Government of the province in their magnificent gift of cheese to the British Government, a gift that calls attention to our resources in manufactured agricultural products, and a gift that will serve to aid our most important industry.

ANIMAL PRODUCTS INCREASE

Our animal products are increasing; they have doubled in value in the last ten years; their value per acre of improved land was $5.2 in 1901 and $10.1 in 1911, and this progress has been helped by the material assistance to buy improved stock, and by public sales of pure-bred stock. A word of warning should be given—much of the pure-bred stock is purchased at some distance from the province without inspection, and inferior animals are often supplied, hence the importance of carefully controlling the character of the stock and purchasing only animals true to type and of good individuality. The Department is also to be congratulated on its stand with reference to the purchase of animals free of tuberculosis. The result of insisting that all pure-bred cattle purchased for syndicates be tested has resulted in greater knowledge among the farmers of the benefits of tuberculin testing.

WHERE QUEBEC CAN HELP

It is along these lines that Quebec can do much to help, more crops for more and better live stock, greater use of waste land for pasturing sheep, so that instead of a paltry 600,000 sheep in the province we should have at least 10 times that number. All should endeavor to seize the present opportunity and attitude of mind of our people to increase production, so that when the piping times of peace come again we shall be able to hold on to these increases and thus promote the welfare of agriculture, the foundation of our industry and commerce.

HUMAN ELEMENT

Let us turn for the moment from the material to the human element. We must remember that a nation is not built up by material gain, but depends on the maintenance and growth of the physical and moral forces of our people. The urban population of Quebec is about 49 per 100 of its total population. In 1901 it was 39 and in 1891 29, and in 1871 19. Conversely in the same period of time the rural population had diminished from 81 per cent. to 51. What is the significance of these figures? In answering this question we must turn to countries where similar conditions have existed for a period long enough to show its effects on the nations.

James Murray, B.S.A., recently appointed Professor of Cereal Husbandry in Macdonald College.

The rapid increase of city population does not mean a corresponding increase in the birth rate, for it may be safely asserted that the fertility of women and the health of men deteriorate and suffer under the conditions of city life. The city workers of the larger English factory towns show marked physical deterioration, stunted growth, contracted chests, and weak constitutions. Germany shows similar results, and Bernhardi, Von Buelow and others have shown the increasing deterioration of the health of men from the large cities as tested by their fitness for military service. Of the parents of those fit for service 75 per cent. came from the country, 1.68 per cent. from the large towns. Both writers point out that "every weakening of agriculture means a weakening of our power of defence, a diminution in our national strength and safety".

You may say that these figures and statements are of no significance to us who have no conscription, but you must not forget that the physical well-being is the basis of our life, and without health and vigour it is as impossible for individual as for nations to grow and flourish.

Much more might be said of the human element and the thesis that agriculture is one of the most potent forces in making a country great, but I must pass on to the educational side of this address.

RURAL SCHOOLS

The rural school more than any one other instrument controls the food supply, the foundation of our physical life. From the point of view of the nation, the work of the rural school is to get a maximum product of efficient citizenship out of the community, and the distinguishing mark of efficient citizenship in the rural community is skill in the production of food. From the view point of the community by which the rural school is maintained the work of the school is to organize the community life, increase its social and economic well-being, and bring to the community the benefits of modern invention, science, and so forth.

From the point of view of the children the work of the school is to preserve their health, to train their faculties that they may advance their individual welfare through efficient work in the service of their homes, their community, and the nation.

This conception of the work of the rural school is a broad one, but it is not overdrawn, and we must next inquire how the schools are meeting these requirements. I can best illustrate this by referring to the work which we are attempting at Macdonald College with an encouraging measure of success. All teachers in training have a practical course in Nature Study and Elementary Agriculture, with special instruction in school gardens, and steps have now been taken by the Protestant Committee of Public Instruction to make the teaching of these subjects effective in our schools by planning a course of study and giving credit for these subjects in both written and oral examinations. Provision is made for the continuation of this work in the model schools and academies by means of graduates of Macdonald College who have been appointed as demonstrators in various counties of the province, and who are now teaching agriculture in 23 academies and schools. This action of the College has been approved and endorsed by the Protestant Committee.

We have also organized in rural schools poultry, corn, potato and other clubs, and provided in 1914 for school children 6,000 eggs of pure-bred Plymouth rock fowls, 5,800 lbs of seed potatoes of a high yielding variety and excellent quality, 350 ears of corn, and 350 packages of flower seeds. We have issued monthly a bulletin to these Clubs giving all necessary cultural directions. The poultry and crops have been inspected by our demonstrators while growing, and to complete the educational character of the work, a school fair was organized for each section where the various kinds of stock and product were exhibited, judged, and explanation of the judging given. These school fairs were a great success, in some cases bringing out more people than attended the Country Fair. The result we expect to accomplish is the introduction of better stock, more prolific varieties of crops, and to arouse an intelligent interest in all these rural affairs with the view of encouraging skill in the production of food.

Besides the Bulletin I have mentioned, we are sending free of charge to every Protestant rural school in the province the College Magazine in which we edit and publish a special section devoted to the teacher and the school, while the rest of the magazine is largely agricultural in character. By this means we hope to take an active share in the local school problems.

Next year we shall have a travelling College demonstrator to aid schools with their school garden, elementary agriculture and other work.

We have not forgotten the physical, social and aesthetic side of school life. Well organized work is given all our teachers in training in physical education, to enable them to give exercises that will develop symmetrically the bodies of the children and give them the elementary principles of hygiene; in music, particularly singing, so that they can impart this art to children; in art to give an appreciation of colour, design and modelling; and in household science we have emphasised the educational value of sewing.

TEACHER THE CITIZEN-MAKER

With the support of the Protestant Committee of Public Instruction and the Department of Agriculture, we hope to make this work even more practical, our object being to make the teacher the citizen-maker of our rural communities.

Passing from the school side to other of our agricultural activities I should like to give a few examples of some of the work being conducted by various departments at Macdonald College. Mention has already been made of the improved variety of Quebec Yellow Corn which was sent out to the school children. Besides this amount 180 lbs. of this improved seed were distributed throughout the province through the Canadian Seed Growers' Association, and in order to give you some idea of the value of this I may state that a prominent seed merchant offered us $100 a bushel for as much as we had. We are about to commence the distribution of some improved barley and oats which we have been testing for the last seven years. One of these, an improved variety of the Siberian oat, gives 4 bushels of grain more to the acre than the original variety from which it originated, and 20 bushels an acre more than the average for the Province. This means that if this oat were generally grown throughout the province we should be able to obtain from 5 to 10 million bushels more than our present yield, worth in round numbers from 2½ to 5 million dollars.

CANADA DEPENDS ON EUROPE

Canada depends largely upon Europe for her field-root and garden seeds. Last year 1 1-4 million pounds of beet and mangel seed were imported from Europe, more than 900,000 lbs. coming from France and Germany. One half our carrot seed comes from France. On account of the war this supply will probably cease, and although there are stocks on hand which will enable Canadian seedsmen to meet the 1915 demand, it is likely that there will be a shortage in production for the year 1916, so it is important that farmers should make provision for their requirements at the present time. We are attempting to interest farmers in this question of root-seed production, and have had since the fall of 1913 demonstration meetings at farms, and have also started a number of experiments at eight centres in the province with a view to inducing root-seed production. A number of farmers have extended their root crop, and by the methods which we are introducing it will be possible for every farmer to save a certain number of mother roots which will enable him to grow sufficient seed for the root crop of his own farm. Our experiments have shown that Canadian-grown seed gives better results than imported seed, and in the majority of cases the experimenters in the province are starting out with foundation stocks supplied by us from home grown roots.

DEMONSTRATION FLOCKS

In livestock work our Animal Husbandry Department has concentrated its attention on increasing the number of pure-bred sheep in the province, and in forming Wool Associations. Our plans have been to a certain extent curtailed by the presence of foot and mouth disease in England, which prevents our importing foundation flocks. Our plans call for the provision of ten flocks in different sections, each flock consisting of a ram and 10 ewes, and we expect from the natural increase to be able to start other demonstration flocks at the rate of ten every second year. This plan provides a flock of pure-bred sheep to the farmer, who has to feed and take care of them, and in return he gets half of the increase. The College takes the other half and with this increase forms other flocks for demonstration. The four flocks that we have established are doing well, and have aroused considerable interest in the sections where they are located.

WOOL ASSOCIATIONS

With reference to wool, we have already formed some Wool Associations. The object of this is to improve the quality of wool coming from various districts. Our demonstrators and staff from the College go into each district and demonstrate to the farmers how to select the wool, how to shear it, and how to prepare it for market. An official grader grades the wool, and it is sold according to its grade. An association which we started in the county of Pontiac has already 500 members, with the result that farmers are getting about 4 cents more a pound for their wool which has been properly graded. We hope to form these associations in every county in which we have demonstrators, who look after the various details in connection with the organization of these associations.

Along horticultural lines our principal work outside the College has been done through the schools, but in addition to this we have assisted in setting out demonstration orchards in several counties and are continuing this line of work.

POULTRY QUESTIONS

Besides the eggs sent to school children we have shipped some 7,000 eggs, principally Barred Plymouth Rocks, to various places in the province, and in addition have built poultry demonstration houses to show the best means of taking care of a colony of fowls of about 100 in number. We have provided these houses with pure-bred poultry, and supervized the work generally, with encouraging results.

Much of this work has been made possible by the College graduates who have been appointed as demonstrators in various counties. These men are furnished with an assistant during the summer months, and besides superintending the work that I have already mentioned they are at the service of the farming community in helping to organize farmers'clubs, co-operative societies and egg circles, looking after fertilizer experiments and giving advice on the best fertilizers for special purposes, conducting spraying experiments, aiding in the repression of fungus and insect diseases, and the suppression of weeds, making out building plans for stables, barns, etc., and otherwise assisting farmers in all the various lines of work associated with farming in its broadest sense.

WOMEN'S CLUBS

We are also attempting to do something for the women, and we found on looking over the situation two years ago that there were only eight women's clubs formed in the province. We appointed a woman demonstrator to these clubs, who proceeded to organize them on a better basis, adapted a hand-book, and arranged for a meeting of delegates from all the organized clubs, who met at the College and adopted a constitution. With the assistance of the Department of Agriculture the book was published, and at the present time 23 of these clubs are now in existence, and all making good progress. We assist these clubs as far as possible in conducting their meetings by sending speakers from the College to discuss various subjects pertaining to the farm home, and we also send out travelling libraries with a collection of books of general informations, and also upon topics pertaining to the business of home making.

Many of these clubs are now helping materially in looking after the patriotic work in their districts, and reports handed in show contributions varying from $15.00 to $300.00. The work for the Red Cross goes steadily on, and in nearly every case the clubs raise their own funds for the materials which are to be made up and sent to the Red Cross. Some Clubs are sending home comforts to the boys from their own county who went with the first contingent.

Agricultural Team. 1st Prize as 3-year old, at Shawville Fair, 1913 owned by Chester Walsh, Shawville, P. Q.

AGRICULTURAL PROGRESS IN PONTIAC COUNTY IN 1914

IN travelling through Pontiac County one cannot help but notice the progress that is being made in agricultural work. New improved fences, cleaner road sides, and perhaps most of all, the number of farmers that are putting in tile drains. Twenty-five drainage surveys were made for farmers in Pontiac, and a number have either completed the putting in of the tile, or have put in a large portion of what their plans call for. Without doubt greater improvement has been made in this line of agricultural progress than in any other, and the outlook is that a large number of the farmers will continue this line of progress, as they fully realize the benefits of underdrainage and wish to make every use of the Power Ditcher that the Quebec Department of Agriculture has working in this section.

For the first time a number of the Pontiac farmers made a beginning at the production of Registered Seed Grain. From the results obtained it certainly has paid them well in greater yield, in practical freedom from rust and smut, and in uniformity of type. In Registered Banner Oats, the yield was from 50 to 60 bushels per acre; in O.A.C. 21 Barley, the yield was from 40 to 50 bushels per acre, both yields being a good deal above the average.

An outline of the agricultural progress would not be complete if the Pontiac Wool Growers' Association were not mentioned. In the early part of May, the Macdonald College Demonstration Branch at Shawville in co-operation with Mr. MacMillan of the Stock Department of the College held a number of Shearing Demonstrations. From these demonstrations developed the Pontiac Wool Growers' Association with a membership of about one hundred sheep breeders. These men agreed to keep each fleece separate, and to roll it as if it were a pelt, but with the white side or inside out, and to tie it either with its own wool or with paper twine, and to put their wool in regulation wool sacks that were provided by the Demonstration Branch. The one hundred members brought in to a central point (Shawville) 11796 lbs. of wool, and there it was graded into the following grades by the Dominion Wool Grader.

Medium Clothing . . .	279 lbs.	23c.	per lb.
Medium Combing . . .	7222 "	22½c.	"
Low Medium Combing. .	3435 "	21c.	"
Black Fleeces	124 "	18c.	"
Rejections	463 "	16c.	"

The wool averaged 21.72c. per lb. or $1.62 per fleece. From these figures any practical sheep man will see that this was a considerable gain over the old method of tub washing. The wool was shipped direct to the woollen mills, and this did away with the middleman that we hear so much of lately.

It also should be noted that the woollen manufacturers who purchased the wool were exceptionally well pleased with it, and also that not one of the members, as far as the writer is aware, was displeased or would go back to the old method on any condition.

We should be slighting the younger people if we did not mention the Pontiac Central School Fair which was held at the Shawville Fair grounds on Sept. the 11th. Twenty-seven schools took part and from these schools three hundred and twenty-four children showed material, making a total of fifteen hundred exhibits.

The exhibit far excelled the expectations of everybody both in number and in quality of the exhibits. It is hoped that a still better fair will be held next year, but this can be only done by everybody giving the work a helping hand.

While a few of the lines of progress have been mentioned above there are a large number of other directions in which progress has been made.

Among these may be mentioned the Cow Testing Association, managed by Mr. R. W. Hodgins, and the Rural Telephone Company which has more than doubled the number of phones on its lines in the past season, and has at present some two hundred and fifty phones. Then the number of silos have greatly increased and with this gain, the amount of corn grown has correspondingly increased. New and better buildings are seen going up on every hand, and there is everywhere a general evidence of progress.

J. K. KING,

Macdonald College Demonstrator
for Pontiac County

Roadster Team, Shown at the Shawville Fair, 1913 by Dr. O'Hara, V. S.

AGRICULTURAL PROGRESS IN HUNTINGDON DISTRICT

AGRICULTURAL progress is necessarily somewhat slow, but in our district some progress has been made during the last year, and prospects are bright for considerable advances during the coming year.

School fair work has developed quite rapidly in this district; last year there was but one school fair in the district, with the pupils of seven schools competing; this year we had two successful fairs at which the pupils of ten schools, comprising about two hundred and twenty-five pupils, took part, and keen interest in the work was shown. Next year we expect to have three fairs, in which twenty-five schools with approximately five hundred pupils will take part.

PRIZE WINNING CORN FIELD IN HUNTINGDON DISTRICT.—Farm of Mr. Buckham. Note check-rowing and freedom from weeds.

Lectures in elementary agriculture are this year being given by the Macdonald College demonstrator in three model schools and one Academy in which no systematic course in agriculture has been given before.

This being a dairying section where comparatively few roots are raised, more than ordinary attention is given to the production of corn for silage. This year the Agricultural Society, under the Provincial Department of Agriculture, held an interesting and successful standing crop competition with silage corn. The competition and the placing of the awards showed the value of after-harvest cultivation, the benefit of using the best seed, the value of check-rowing and thorough intertillage. Much interest was aroused, and it is hoped that considerable benefit will result to the silage growers of this section.

Increased interest in root growing has been aroused, due largely to the marked success of a number of growers with turnips this year. A number of men have also decided to take up root seed production next year; school boys and girls are also being encouraged in this work.

Alfalfa had a fair opportunity this year to demonstrate some of its possibilities. Coming through the winter fairly well, it has considerably outyielded any of the other hay crops; three tons or more per acre being harvested on some fields. Next year we hope to start some of the hardier Grimm strains, and an effort to produce seed of these strains will also be made.

An experiment in using fertilizer on roots was successful, showing a decided profit in properly applying fertilizers; lectures have also been given on fertilizers and their uses. The question of home-mixing was thoroughly discussed, and it is possible that this work will materialize in the farmers of different sections cooperating to buy fertilizing materials in carload lots, and mixing the materials at home. Some experimental work with fertilizers is contemplated for next year.

Drainage work has been discussed to some extent, and it is expected that next spring a large number of farmers in this district will apply for free drainage surveys of their farms, and we also hope to have a ditcher in operation in the district next season.

The Horticulture Department of Macdonald College gave a demonstration at Rockburn last spring in pruning and spraying an apple orchard. The results were particularly satisfactory, shown by the fact that practically the entire crop of apples was destroyed and the trees defoliated in orchards not properly sprayed.

A number of new up-to-date barns have been put up during the past season. The construction of these is good, and particular attention is being paid to the lighting and ventilation of the stables. Combined ice-houses and dairies removed from the stables are being constructed on many farms.

Although there is not a great number of sheep kept in this section, we have a number of very enthusiastic sheep-breeders. Among these there has been some discussion regarding the formation of a wool-growers' association. Every sheep owner spoken to has declared himself in favor of the plan, and also in favor of the proposed new legislation regarding dogs.

The various Agricultural Societies of the district held very successful fairs this year. The Huntingdon Agricultural society this year revived the annual plowing match and intends holding a winter seed-fair.

Apart from the general Agricultural Societies we have practically no farmers' organizations; and along this line we have considerable opportunity for advancement; there is some hope of forming Farmers' Clubs in two or three municipalities for the purpose of discussing Agricultural subjects, and also with the idea of taking up cooperative buying of farm supplies.

We have in this district one very progressive Homemakers' Club; this has been of great assistance to the Demonstrator in the school fair work. There has been considerable agitation toward the formation of others in different parts of the district.

R. E. HUSK

AGRICULTURAL CONDITIONS IN SHERBROOKE COUNTY

SEVERAL of the farmers in this County cut small areas of clover this autumn for seed and some have already had the product threshed by means of the huller furnished by the Agricultural Society. In some cases the clover was hardly ripe enough; however, some good seed was produced, one farmer having about two hundred pounds. Experience shows that when the second crop is to be cut for seed, the first crop should be cut about the middle of June. It is hoped that many more farmers will grow clover for seed next season now that the Agricultural Society has a clover huller of its own, and as the home-grown seed is proving much more satisfactory than the commercial seed.

Some of the farmers in this district, realizing the possibility that there might be a scarcity of root-seed in the spring of 1916, have decided to try to raise some seed next season. Several farmers have some roots in storage with that end in view. This is a splendid line of work, as home-grown seed in home soil is bound to give the best results.

The frost set in rather earlier than was expected, and some of the farmers had still a few day's plowing to do. A few farmers, realizing that the price of grain would be high next season, have plowed more land this fall than usual, with the view of producing more grain next year.

W. G. MACDOUGALL

AGRICULTURAL PROGRESS IN COMPTON COUNTY

WHILE a good deal has been written of late about Compton County in the pages of the "Journal of Agriculture", I feel that we cannot have too much of a good thing. With this idea in view, I am going to show a few of the forward steps which this county has taken in matters agricultural during the past year.

For a first evidence of progress, we shall look at the crops produced as compared with 1913. In almost all lines there has been an increase both in acreage and yield per acre. This is especially to be noticed in regard to the wheat crop. Some remarkable yields have been registered this year, and the quality of some of the flour ground at the Cookshire Flour Mill cannot be surpassed by the best Manitoba. We also have to record some remarkably large turnip yields. Old meadows gave a small crop of hay on account of the dry weather, but the new seeding was good. Many of our farmers are coming to realize the importance of breaking up the meadows often and then putting on a good, heavy seeding of grasses and clovers.

In order to help in procuring this clover seed some of our farmers are determined to raise it for themselves. This year several men obtained a small amount of seed, but in no case was a large quantity threshed out. This was chiefly owing to the fact that the first crop was cut too late. However, the men are not discouraged but are determined to get a good lot of seed next year.

In live stock matters we also see a marked improvement. This is especially the case in regard to sheep which are everywhere increasing in numbers. It is to be hoped that this increase will continue, as a great deal of Compton County is admirably adapted to sheep raising and at present prices it is a most profitable business. The two greatest needs in connection with the sheep business are (1) a better dog law, (2) a better wool market. It is hoped that something may be done to remedy both these needs at an early date.

The Annual Scotstown Exhibition was this year a greater success than ever, both in regard to exhibits and the amount of interest shown. The boys who entered the judging competition did good work, and it is hoped that we will be able to send a county team to the Ormstown Fair next spring.

The work of Macdonald College in supplying material for school children's competitions in the raising of chickens, flower seeds and potatoes has given good results. Anyone who was present at the School Fair in Cookshire will attest that it was a great credit to all concerned. This school work is being further enlarged on for next year, when it is hoped to include nearly all the schools and to hold two school fairs. Classes in Nature Study are being conducted by the Macdonald College Demonstrator in six of the larger schools of the county throughout the winter months.

The new Experimental Farm at Lennoxville has got well started and should prove of great assistance to the farmers of Compton and other surrounding counties.

Underdrainage has received an impetus from the government's offer which resulted in the making of a number of surveys in this locality, as mentioned in a previous article in this paper.

The buying of fertilizer in the form of raw materials and mixing at home was greatly increased this year and gave most satisfactory results, wherever practised. The formalin treatment of oats for smut was tried in a few cases and will be much more extensively used next year, as results were excellent.

In general the farming community of Compton County has progressed materially during the year 1914, and we feel confident that this progress will continue even in the face of these great world troubles.

A. E. RAYMOND,

Cookshire

LENNOXVILLE FARMERS' CLUB

THE annual meeting of the Lennoxville Farmers' Club was held in the Demonstrator's Office on Thursday evening. The president, Mr. John Nichol, was in the chair, and there was an attendance of about thirty members.

The financial statement of the Club was read by the secretary-treasurer, after which the auditors and directors were elected, as follows:

Auditors—Messrs. McClary and Reed.

Directors—Messrs. W. J. Parnell, D. L. Herbert, J. Nichol, W. S. Armitage, J. H. M. Parker, F. R. Mitchell and J. McClary.

At a subsequent meeting of the board of directors, the following officers were elected: Pres., Mr. F. R. Mitchell; Vice-President, Mr. J. McClary; Sec.-Treas., Mr. W. G. MacDougall.

A very interesting lecture was given by Mr. A. A. McMillan, B.S.A., on "The Co-operative Marketing of Wool."

SOIL MANAGEMENT IN RELATION TO YIELD AND QUALITY IN SEED

(Continued from Dec. number.)

ROTATION AND CROPPING

HOW to produce larger crops and increase the net profit per acre, without depleting the soil of its fertility, is a pressing problem. Rotation of crops is generally regarded as the most effective method of accomplishing the desired result. In planning a rotation, however, certain important principles must be borne in mind. In general practice, a rotation should furnish a money crop, a hoed or cleaning crop, a live stock crop and a legume crop. A knowledge of crops is as essential as a knowledge of soils, because crops differ in the length and disposition of their root systems, in their time of feeding, in their power of assimilation and foraging, in their effect on the texture of the soil and in the amount and value of their residues.

Again, all crops exhaust the fertility of the soil; but all do not deplete the fertility uniformly. Most crops extract much and return little or nothing; others add one element and draw up other elements from lower depths, which they leave near the surface.

All cereals are soil-exhausters. All legumes are soil enrichers, at least in the most expensive element of plant food in which our soils are apt to be deficient, namely, nitrogen. Over two thousand years of recorded observation goes to show that cereals produce larger crops when they follow a legume such as peas, beans or clover. Therefore, in any permanent system of successful crop growing, the culture of clovers and closely allied species must have a place.

Whether the rotation is a three, four or five-year one, is a matter to be determined wholly by circumstances. The essential thing is that a systematic rotation be followed, that the product of the fields be consumed by live stock, and that the residue be returned to the land with a minimum of waste.

The oldest soil experiments in the United States with an authentic record and with a present continuation of the experiments originally inaugurated, are at Urbana, Illinois, and were first planned by Prof. Morrow in 1879.

Dr. C. G. Hopkins in his recent book on "Soil Fertility and Permanent Agriculture," in dealing with the corn-oats-clover rotation on this land, says:

"As an average of the three years where corn has been grown every year, the yield has been 27 bushels in the 29-year experiments and 35 bushels in the 13-year experiments. The lesson of these experiments is that 12 years of cropping where corn follows corn every year reduces the yield from more than 70 bushels to 35 bushels per acre, after which the decrease is much less rapid, amounting to only 8 bushels reduction during the next 16 years. Undoubtedly the rapid reduction during the first twelve years of continuous corn-growing is due in large part to the destruction of the more active decaying organic matter, resulting ultimately in sufficient liberation of plant food within the feeding range of the corn roots. In addition to this, the development of corn insects in soil on which their favourite crop is grown every year is sometimes an important factor in reducing the yield."

"Where corn is followed by oats in a 2-year rotation, the average yield of the three crops of corn is 46 bushels in the 29-year experiments, whereas in the 13-year experiments the average yield for the same three years is 62 bushels of corn per acre. In this case the destruction of humus is less rapid, and the development of the corn insects is discouraged by changing to oats every other year, so that the decrease in yield is less marked during the early years, although the reduction continues persistently with passing years. During the first 11 years the yield decreased from more than 70 bushels to 62 bushels, and during the next 16 years a further reduction of 16 bushels has occurred."

"With the 3-year rotation, corn is grown for one year, followed by oats with clover seeding the second year, and clover alone the third year. During the first ten years under this system the yield of corn has decreased from more than 70 bushels to 66, and during the next 16 years the yield has further decreased to 58 bushels, the average reduction being only one-half bushel a year. In this system the most marked reduction in crop yields has not yet appeared, although it must be expected in the future because the clover crop is already beginning to fail on the oldest field, even in seasons when clover succeeds well on newer land under the same crop rotation. When clover fails, cowpeas are substituted for that year on that field, which thus provides a legume crop and preserves the 3-year rotation".

At Macdonald College, where oats have followed oats for four years on well-tilled land which has not had any manure or fertilizers for 7 years, the average yield per acre has been 53.67 bushels, as compared with an average yield of 68.19 bushels per acre for the same variety on rotated land for the same period.

Where barley has followed barley under the same conditions, there has been an average yield of 29.29 bushels in favour of the rotated plots. It is only fair to state, however, that the rotated land has been sufficiently heavily fertilized to enable it to produce good crops without incurring risk from loss through lodging.

Certain of the plots at Ste. Annes have grown alfalfa continuously for 8 years. These plots have not had any manure for 22 years and no one has been found who knows when manure was last applied. Compared with the manured plots beside them, the spring seeded one shows a yield of 4.35 tons of hay, as compared with 5.02 tons; while the fall seeded one averaged 3.46 tons as compared with 4.98 tons on the manured plot. In both cases the unmanured plots showed a higher percentage of cured hay, the spring sown one being one per cent higher and the fall sown one practically five per cent higher.

DATES OF SEEDING

Few, if any, cultural experiments in this country have thrown as much light upon this phase of the subject as has the experiment, conducted at several stations, and known as dates-of-seeding experiment. Briefly summarizing the results with regard to yield, we see that with all classes of small grains, with the exception of peas, the largest average yield has been obtained from the seeding put in just as early as the land could be worked to advantage. Later seedings, with but few exceptions, showed a marked falling off in yield of grain as well as a pronounced deterioration in the quality of the resulting crop.

Among the many factors contributing to the lessened yield in the later seedings, the following are deserving of mention; Poor textural condition of seed bed; lack of sufficient soil moisture to ensure uniform germination and evenness of tillering; imperfect development of kernels due to the effects of intense heat at the time of filling; lack of uniformity in maturing and injury from the attacks of rust.

RATE OF SEEDING

The rate of seeding also directly influences yield and quality in practically all field crops. Usually the yield is affected more adversely than the quality. With non-tillering varieties, heavy seedings tend to greater uniformity of product and higher yield than lighter seedings, providing soil moisture requirements are met; but heavy seedings with stooling varieties materially lower the yield and quality of the crop. If the rate of seeding is too heavy, the crop will give unmistakable evidence of it in the lack of tillering, fineness and shortness of straw, tendency to lodge, susceptibility to rust, abnormal earliness of ripening, low yield and lack of scale in the size of the resulting grains.

Moisture, not fertility, is usually the determining factor governing the rate of seeding, whether the grains are seeded in a district of ample rainfall or whether they are sown in a semi-arid country.

GRAINS SOWN SINGLY AND IN COMBINATION

A pronounced increase in yield, and a still more decided improvement in quality, is secured when grains, which mature at the same time, are mixed and sown in proper proportions. This is especially true in the case of wheat.

DRILLING AND BROADCASTING

Drilling, while generally to be commended, is especially advisable where moisture is the limiting factor. Where this condition obtains, double disc drills are to be preferred to other types, because they bring the seed in closer contact with moist soil. This results in a more prompt and even germination, which not infrequently determines whether the crop will have time to mature or not. Press drilling, preceded and followed by the packer, frequently results in a profitable crop; whereas broadcasting, or poor drilling, with or without the judicious use of the packer, would result only in failure. What has been said with regard to the drill is equally true with regard to the summer-fallow and stubble land for wheat. In fact, the successful growing of any adapted grain crop in the drier parts of our Canadian West is dependent, in large measure, upon the ability of the farmer so to manage his soil as to retain a sufficient amount of moisture for the proper development of his crops. Indeed, his methods of ploughing, cultivating, packing, seeding and after-harvest discing are all governed by this one consideration—the conservation of moisture— in sufficient, but not too great, quantities for maximum production, consistent with early maturity.

Cultivation of small grains to induce tillering, as well as to form a mulch, influences yield and quality. This is especially marked in the matter of uniformity of ripening and the preventing of a second growth when, for any reason, ripening has been unduly hastened.

In our improvement work at Macdonald College with grasses, clovers and alfalfas, as well as with cereals, the influence of drilling, as compared with broadcasting, is very pronounced. For example, many timothies will produce two crops of hay in a season when sown in rows and kept thoroughly cultivated. Common red clover, a biennial, when sown as late as the second week in June, will, under these conditions, sometimes mature seed perfectly within less than four months from the date of seeding. Alfalfa, when sown in rows and kept thoroughly intertilled, will give one, and sometimes two crops more during the season than will the adjoining broadcast plots. Moreover, alfalfa seeded in rows and kept cultivated, will give a large yield of excellent quality seed compared with the yield of seed from broadcast plots.

CORN IN HILLS VS. DRILLS

Whether for grain or for ensilage, planting corn in hills is to be preferred to planting in drills. This is especially true when grain is the prime consideration, as yield, and especially quality, are to be found in the hill plantings. The proper rate of planting, however, must be more carefully conformed to in corn than in small grains for, although the yield of grain per acre will increase up to five stalks per hill, the size of the ears and the quality of the grain deteriorates rapidly after there are more than four stalks per hill.

Frequent shallow cultivations will prolong the growing season for corn and will tide the crop safely over a hot, dry period, which would otherwise check the growth of the plants and so reduce the yield. In seasons of abundant rainfall, however, cultivations should only be sufficiently frequent to hold weeds in check, otherwise too much late top-working will retard the maturity of the grain. If late cultivations are wide and deep, the first effect is to check the growth of the crop as a result of the root pruning. In this event, if the growing season is a prolonged one, the injured plants sometimes make a second growth, and so the crop is late and uneven in maturing. The same principle holds equally true with root crops grown for seed.

ROTHAMSTED EXPERIMENTS UPON WHEAT AND BARLEY

Undoubtedly Broadbalk is the best known experiment field in the world, and plots 2 and 3 are the most often referred to. While the continuous growing of wheat on the same land is not to be considered the best practice, the records show very clearly that it is possible. "In the case of the unmanured plot, under the continuous growth of wheat on the same land, there was", says Director Hall, "a small decline in production for the first 18 years, yet the crop has been practically constant during the last 40 years. The fluctuations during the period are, in the main, due to season, and correspond very closely with those of the completely manured plots. All evidence seems to point to the fact that this plot, which has been without manure of any description since 1839, has reached a stationary condition and will in future diminish very slowly, if at all."

"Under continuous barley growing the decline has been much more marked than on the wheat plot similarily treated, the average crop having been only 10 bushels for the past ten years, as against an average of more than 15 bushels for the whole period. The continual fall of crop from decade to decade would seem to show a progressive exhaustion of the soil, without reaching the comparatively stable condition of the continuously unmanured wheat plot. The more limited root range of the plant would bring about a complete exhaustion of the available soil much sooner with barley than with wheat. On the whole, however, the results point to the probability that unmanured land will become unable to grow barley continuously at a much earlier date than will be the case with wheat, so comparatively restricted is the range of the barley roots."

"The fundamental importance of cultivation and the suppression of weeds", continues Director Hall, "is to be seen in the returns from the continuously unmanured plot. This piece of land at the beginning of the experiments was not only in poor agricultural condition, but had been under arable cultivation for at least two or three centuries, and was therefore far removed from the condition of virgin soil with its accumulation of fertilty, and yet by cultivation alone it has been able to grow for sixty years a crop averaging 13 bushels to the acre. This is almost the average crop produced in the United States, and is very similar to the general average production of the wheat-growing areas of the world. Nor is there, as far as can be judged by the records for the last forty years, any reason to expect that this crop cannot be maintained in the future, provided that the cultivation and cleaning of the land be continued."

So much for the effect of the system of soil management on crop yields as these relate to the Rothamsted work. Let us now direct our attention to a consideration of the influence of this management on the character of the resulting crop. In this connection Director Hall says:

"The farmyard manure plot has given on the average the best grain, showing the highest weight per bushel and the highest price in commercial valuation, but there are several years in which corn from this plot occupied a very low place in the series. It is important to notice that the continuously unmanured plot, with its small yield, yet produces grains of corn which are almost up to the average in size, weight per bushel and value from the commercial point of view. The plant, when starved, diminishes the number but not the quality of the seed; even the proportion of "tail" grain is not above the average on the plot. The proportion of corn to straw is the highest on the plot, as though starvation resulted in concentrating the highest possible proportion of material on the reproductive parts of the plant."

"On the whole it will be seen that the great differences of manuring to which the Rothamsted plots have been subject for so long a period have a much greater effect on the gross amount of crop than on the quality of the grain. Fluctuations in the amount of the crop due to season or manuring are reflected to a much smaller degree in the composition of the grain; the composition of the straw, however, shows wider variations, induced by the differences in the manure applied".

CONCLUSION

From a consideration of the above evidence, part of which may rightly be regarded as conclusive by virtue of the number of years of careful experimental work behind it, and part of which is based upon observations and results of fewer years of work, we are justified in concluding that soil management plays an important part in influencing the yield and quality of all classes of field crops, and what may be termed "reasonably good management" influences the yield much more than it influences the quality.

RAM NOT LIFTING WATER PROPERLY

QUESTION.—About a year ago I installed a ram to lift water to my house at an elevation of 25 ft. and have been troubled with air chamber filling with water. The ram is a No. 3 and works well except the fault above mentioned. The plunger works but does not push water. Can you tell me the cause and remedy for same?—A. G. Compton Co.

Ans.—There are a number of things which may be wrong with your ram. We cannot say, of course, which of these it is without seeing the ram. However, you can investigate yourself. If the discharge pipe comes out at the top of the ram it is possible that there is a leak between the pipe and the top of the air chamber. Also it is possible that there is a hole in the discharge pipe in the air chamber. If the discharge pipe leaves the ram at the base of the air chamber, the above cannot be the cause.

We think, however, that the probable cause of your trouble is as follows:—In any ram the air will be gradually taken out of the air chamber unless fresh air is supplied to it. The reason for this is that water absorbs a certain amount of air and thus the air is gradually taken away with the water. To remedy this difficulty rams are usually supplied with a small air inlet. That is, a small hole about 1-16 to 1-8 inch in diameter. This is usually bored in the base of the ram on the side towards the drive pipe, and just below the valve in the air chamber. This hole admits a little air just at the end of the driving motion of the water in the drive pipe. This air keeps up the supply in the air chamber. We advise you to examine the ram carefully for such a hole and open it up if you find it. If you do not find it, have a very small hole bored. Be sure it is below the valve leading into the air chamber.

C. J. LNYDE

SOME BASIC PRINCIPLES OF AGRICULTURAL CHEMISTRY

A pamphlet has been issued by the Central Experimental Farm entitled "The Farmer as a Manufacturer". It has been prepared by Mr. A. T. Stuart, B. A., Assistant Chemist, who has presented a number of simple illustrations of the chemical processes that take place in vegetable and animal life.

The processes are indicated by which the farmer, whose raw materials are but air, water and soil, is able to manufacture therefrom an apparently endless variety of products—both plant and animal. It is shown, however, that their composition is to be easily understood, consisting as they do of but four principal constituents. The nature of the raw materials, the process of manufacture and the products are discussed.

Under the heading "Maintaining Fertility" it is pointed out that "the farmer must exercise extreme care if he would keep his soil in the highest condition of productiveness. Soil is the real guardian of the farmer's capital, and the security is absolute. Try as he may he cannot "Break the bank". He may bring about temporary derangement and dividends may for awhile be suspended, but invariably under better management prosperity can be restored and perhaps even larger profits than ever secured".

The pamphlet, which is Bulletin No. 20, of the Second Series, is available to those to whom the information is of interest on application to the Publications Branch of the Department of Agriculture at Ottawa.

SUPPLY OF POTASH

German Supplies cut off. New Sources of Supply. More attention to Barnyard Manure

CANADA is a small user of commercial fertilizer as compared with such countries as Belgium, Luxemburg, Holland, Germany, and the United States, and for that reason is not likely to suffer to any great extent from the predicted shortage of potash salts. We, in Canada, are not intensive farmers in the same sense as are the inhabitants of the countries previously mentioned, which accounts for the comparatively small amount of commercial fertilizer used. As, however, the country develops, and our consuming population increases, there will be an ever increasing demand for certain foodstuffs, particularly garden truck, and as these are produced near the cities and as a consequence on land which costs heavily, it will be necessary to get the most out of the land in the shape of maximum crops. To this end the demand for fertilizer will increase. Potash is one of the most important of these plant foods.

Practically all the potash used in the manufacture of commercial fertilizer comes from Germany, and, as a result of the war, the source of supply has been entirely cut off. In 1912 the world's consumption of potash salts amounted approximately to 4,500,000 tons, and of this probably 99 per cent came from the Stassfurt mines in Germany. There are in that country fifty-three potash mines controlled by the Kali syndicate, the amount that each mine shall produce, the quantity of potash that shall be shipped out of Germany, and the price of the potash all being fixed by the syndicate. They have a corner in potash.

Now that the source of supply has been cornered, the question arises, where can the farmer obtain potash? The United States last year imported potash, in the form of kainit (542,000 tons), manure salts (261,000 tons), muriate of potash (238,000 tons), and sulphate of potash (452,000 tons), to the value of $15,000,000, and it is reported the supply is practically exhausted. These figures are of interest to us, because the Canadian houses, for the most part get their supply through the United States.

OTHER SOURCES OF POTASH

Every other source of potash will now have to be carefully utilized, as no other substance will take its place as a plant food.

Washington authorities state that a large deposit of potash salts has been located in California. While the content of actual potash in these salts is not very high, yet the report claims that the deposit contains an equivalent of 6,000,000 tons potassium chloride. A company has been formed to operate works for the refining and marketing of the potash and other constituents present. When complete, it is expected the works will have a daily output of 500 tons of potassium chloride. As, however, an initial unit of the plant is to be operated experimentally first, there is no prospect of an immediate relief from this source.

No other domestic deposits have yet been developed to any great extent. Our common feldspar rocks contain quite a percentage of potash, but the difficulty is to extract it in a form available for plants, and at a cost within the farmers' reach.

On the sea coast seaweed is an available source of potash, and that found on the Pacific coast has been used to some extent. In fine weather, this source could be made more widely available. Seaweed is bulky stuff and will not pay for long carting.

All plants contain a varying proportion of potash in their composition. When twigs, leaves, weeds, and such growth are burned the potash is in the ash which remains in an available form, and it has been pointed out that a ton of such ashes would be as good as a ton of potash. This may be so, but we venture to think it would take more twigs, leaves, and weeds than could be found on half a dozen farms to provide a ton of potash that way.

BARNYARD MANURE AGAIN

It seems that the farmer's best friend after all is barnyard manure, and as has been pointed out many, many times, the best receives the poorest treatment. If potash cannot be found and brought onto the farm, then the sources available to the farmer on the farm must be utilized. A ton of barnyard manure contains about 10 pounds of potash. This does not apply to all the barnyard manure put on the land. As was pointed out and illustrated in the Family Herald and Weekly Star recently, much of the valuable plant food constituents originally contained in the manure are lost by heating, leaching and other causes. In these losses, caused by three months exposure, we find 22 per cent of the potash disappears. The remedy, however, is easily applied, and few farmers are ignorant on this question. They have in the past been indifferent, but now this must disappear, and an effort put forward by all to make up at least some of the lost ground.

POTASH IN DIFFERENT CROPS

A study of the quantity of potash in some commonly grown crops, feeds, manures, etc., will give the farmer a better idea of the part played by this plant food. One ton of field cured corn stalks contain 20 to 40 pounds of potash, hay 20 to 40, straw 10 to 20, potatoes 5 to 7, corn 7 to 10, small grains 5 to 10, bran, malt sprouts, linseed meal 25 to 35, middlings and shorts 6 to 12, nitrate of potash 920, unleached wood ashes 100 to 150, air dried kelp and rock weed 40 to 60, fresh horse manure 10 to 30, cattle manure 4 to 10, hog manure 6 to 15, poultry manure 10 to 20, tobacco stems 100 to 125, tobacco stalks 20 to 30. All the figures are the number of pounds of potash in one ton of the substance.

Conservation and intensive tillage must be the farmer's watchword, and if the shortage in one of our fertilizers makes the farmer prepare the land and cultivate more thoroughly, grow more legumes, and husband the possible sources of plant food supply he has at his command, then, what some look on as a blow to farmers, may in the long run result in benefitting the farms of the country. —WEEKLY STAR.

SAYINGS WORTH REMEMBERING

(From the Sherbrooke Exhibit of the Cereal Husbandry Department, Macdonald College, P.Q.)

1. To produce a good crop we must have good land, good seed, good preparation of the ground, and last, but by no means least, a good man.
2. Knowing how, is essential for success—also in agriculture.
3. When building a house, do you start with the roof or with the foundation? Soil preparation is the foundation in farming.
4. Crop yields, to a great extent, are determined by the amounts of available water and plant food in the soil.
5. Drain your land wherever necessary, but do not sink tiles and money where they will bring no return.
6. Fall plowing increases the capacity of the soil to absorb and retain moisture.
7. A stroke with the peg—tooth harrow early in spring on all land to be seeded, will break the crust, form a mulch and conserve the moisture.
8. More careful screening and fanning of the seed, and less growing of untried sorts, is strongly to be recommended.
9. The time is past for guessing that this seed, or that, will germinate all right. We must know; and to know means—to test.
10. The Lord helpeth the early seeder.
11. All crops not seeded down to clovers and grasses, should be harrowed across the drills once or twice, and sometimes even three times.
12. Don't forget that the legumes are collectors of nitrogen; in comparison with which gold has only a medium value.
13. Clover and other legumes unlock hidden treasures of the earth for following crops.
14. Just as a fast horse will maintain its superior speed only under careful management, so the alfalfa can develop its phenomenal power of production only under suitable conditions.
15. Lack of proper soil preparation is the prime cause for numerous failures with alfalfa.
16. Corn, properly handled, cleans the land and gives a high yield of valuable feed.
17. A big root crop is generally cheap, comparatively speaking,—a small crop is always expensive.

P. A. B.

SWEET CLOVER

Not recommended as a forage crop.—Not equal to alfalfa and apt to become a weed

ON account of the lively discussions that have been conducted for the past year or so regarding the merits of sweet clover, M. O. Malte, the Dominion Agrostologist, has undertaken to collect and present the facts about its growth. While not condemning the plant, Dr. Malte advises caution in sowing it for a crop. In the first place he says that its ability to live in soil where the food supply is scant is largely responsible for the praise bestowed upon it in recent years.

AS A SOIL IMPROVER

Like most other biennial plants, sweet clover develops a strong and somewhat fleshy tap root which penetrates the ground to a considerable depth. Its numerous branches break through even very compact soil thus making it porous and penetrable to air and water. The fleshy nature of the taproots makes them decay readily when the plants, after the end of the second year, die. Considerable humus can also be added to the soil by incorporating with it the rather rank top growth.

For these reasons sweet clover is no doubt of great value on old, wornout land and on soil the mechanical condition of which needs improving.

Like other leguminous plants, sweet clover through assistance of certain bacteria has the faculty of gathering nitrogen from the air circulating in the soil. Soil deficient in nitrogen will consequently be improved through the growing of sweet clover.

In this connection it must be mentioned that the bacteria occurring on the roots of sweet clover, seem to be identical with those occurring on the roots of alfalfa. At any rate, they act in exactly the same way as alfalfa bacteria, and soil from a sweet clover field can therefore be used to advantage for the inoculation of fields prepared for alfalfa. For the same reason, sweet clover can be used on poor soil as a preparatory crop for alfalfa.

As a hay crop sweet clover cannot compete with alfalfa since full crops can be relied upon only every second year.

Whether animals, unfamiliar with sweet clover, will like it or not from the beginning also depends upon what time of the year they are pastured on it. If turned on to it early in the spring when the plants are very juicy and tender, they will have less objection to it than later when the plants are better developed. This is due not only to the fact that early in the spring the animals are hungry for green feed, but also because the young plants contain a smaller amount of cumarin than the older ones and consequently are less bitter.

It is often claimed that sweet clover, on account of being a biennial plant, cannot assume the character of a weed, if properly handled. Being a biennial it lives only two years and if the plants are prevented from going to seed the second year, there should be no danger of sweet clover spreading all over the farm.

Theoretically this is perfectly correct and sounds well, but in practice it turns out to be quite different.

Dr. Malte goes so far as to say that sweet clover, when once introduced on a farm, will prove almost impossible to get rid of, no matter what precautions be taken. Many a farmer, believing that he had destroyed every sweet clover plant on his farm before it had had any chance to set seeds, has been painfully surprised to discover that, in spite of all, sweet clover suddenly appeared in the most unexpected places. In practice even the most careful eradicative methods and the most careful effort to prevent it from going to seed have too often proven in vain. Over and over again it has been discovered that seed, in spite of

LIVE STOCK

THE LIVE STOCK SITUATION IN THE PROVINCE OF QUEBEC

(An address delivered at the Winter Fair, Guelph, Ont., December 1914.)

In attempting to determine the live stock situation in any section of this country or in the country as a whole, one must depend in large measure on statistics for a basis of calculation. Masses of figures are available which in themselves furnish a general report. Frequently they are misleading however, and in order to appreciate their full significance in live stock from a provincial point of view, it is necessary to view them comparatively and relatively—comparatively in regard to provinces, classes, conditions, breeds, products, etc., and relatively in regard to the provincial position. Therefore, if I seem to get far beyond the field allotted in my subject it will not be because I am ambitious for territory but because by so doing I can better ascertain the position of Quebec.

GENERAL SITUATION ON THE FARM

As a country we have something to be proud of in live stock, but we have also reason to feel disappointment in our standing and in the progress we are making. Comparison with other countries affords little relief. True, we have a new country with a large output, but at present one might say we are doing little more than supplying a comparatively small population with animal products. A recent compilation shows Canada to have available for export 8% of amount of meat consumed and 12% of amount of Dairy Products consumed. Considering our resources we have a long way to go to overtake some of our competitors. On the farm we posses roughly in fractional form about 1-63 of the world's cattle, 1-47 of the horses, 1-28 of the sheep and 1-58 of the swine, the United States possesses, a little over 1-8 of the world's cattle, about ¼ of the horses, 1-12 of the sheep and almost ½ of the swine. Even per capita the advantage is still with the United States and yet everyone is ready to acknowledge the natural aptitude of the Canadian stockman and the great agricultural resources of Canada. Such a contrast certainly shows room for great expansion in this country.

Since 1900 we have made slight progress in all classes of stock in the Dominion with the exception of Sheep, but the numbers do not show any great increase. The total value on the other hand does show material increase in all classes with again the exception of sheep, where it remained about the same in spite of the decreased numbers.

In view of the rapid strides in what may be termed the newer provinces, these figures are very suggestive as to the situation in the older provinces. It would seem that they are not marching ahead in many cases. Where then does Quebec stand?

In total value of farm animals Ontario stands first with a good lead. Quebec is fourth. In Quebec the total value has almost doubled since 1901 and is now over 92 millions dollars. The increase in individual value is a big factor but the showing in numbers is not unfavorable. From 1901 to 1913 Quebec shows increases in every class of live stock. In the last four or five years however, swine have not been gaining and milch cows have lost. In regard to sheep, Quebec had more sheep 40 years ago than she has to-day. This is true of the Dominion in general. The decline however seems to have been checked in Quebec in 1909, the only one of the older provinces that seems to have turned the tide in sheep. Ontario continues to drop rapidly.

LIVE STOCK PER FARM

Looking at the situation from the individual farm standpoint I find the average size of farms about equal in Quebec and Ontario, but that Ontario has a distinct advantage in stock per farm, although Quebec has done well in the past decade, increasing from $387.00 to $600.00 worth of stock, or 55% per farm of 97.63 acres. In point of numbers both provinces are increasing somewhat per farm. Quebec carries less stock per farm but is gaining somewhat on Ontario in output of animal products. In 1913 she had 19.1 animals per holding, including 2.3 horses, 4.7 milch cows, 4.3 other cattle, 3.7 sheep, and 4.1 swine—not very heavy stocking it would seem. She showed an increase in ten years in horses, other cattle and hogs, but a decrease in milch cows and sheep per farm. Ontario farms average 26 head and show an increase in horses, milch cows and swine but a decrease in other cattle and sheep. In this connection I have already stated that Canada as a whole is being kept busy to do much more than feed herself, although in some products we have a creditable surplus. Both provinces should be able to carry more stock per farm.

PRODUCTS

Live stock sold

Quebec is still well behind Ontario in revenue from live stock sold but she has in the last decade led all the older provinces in proportionate increase, jumping from $6,650,480 to $20,406,385 or about 325.0%.

Slaughtered on farm

Like all other provinces she remains about stationary in animals slaughtered on the farm.

Dairy

In dairying all the provinces have made rapid strides, but Ontario and Quebec still contribute the bulk of these products. In ten years Quebec increased from $20,207,862 to $31,663,220 or 56.68%. I regard the increase in dairy cattle and the expansion of dairying in the older provinces as a logical outcome of the general agricultural situation, and it is somewhat disappointing to note that neither Quebec nor Ontario has materially increased the number of milch cows in the past few years. On this point the recent report of Mr. Ruddick is encouraging. It states that in 10 years the number of cows in the Dominion increased only 7% but the production increased 43%. Many of us who are striving to aid the dairy farmers may like to claim a share in this, but I am inclined to think an important factor in the increased production is winter dairying and longer lactation periods. In any case we are getting more out of the cows.

The milk and cream trade

Dairying as the main feature of mixed farming goes hand in hand with density of population and proximity to towns and cities. The possibilities for returns on fairly high-priced land, labor and capital, are good, and the demand for milk is increasing. Milk cannot be transported great distances, so farms within the radius must supply it, and those at great distance from the milk market must supply other products. The demand for milk and cream is increasing, hence the tendency for more farmers to enter winter dairying. The milk trade however can be very easily overdone and those who can make it optional by having alternative outlets in butter, cheese, etc. are in the safest position. True these can be produced most cheaply where feed is cheap and they can be transported easily and for less money than the feed, but the milk trade can be so easily overdone that they must accompany it and they afford even greater outlet than market milk in Ontario and Quebec.

Export trade in milk and cream

Mention might be made here of the outlet in export trade for milk and cream. With the removal of the U. S. A. Tariff in 1913, this trade received quite an impetus for a time. Market conditions, however, did not justify a big trade; so, while this means considerable to Quebec, the returns do not show any great amount going in this direction, viz.: 1911 — 1,881,923 gals. of milk & cream from Can. to U. S.; 1913 — 828,299 gals. of milk and cream from Can. to U. S.

Dairy by-products

In dairy by-products, which have a lot to do with the live stock situation and its possibilities, Quebec and Ontario are both extremely well off. Both are strong in factory cheese with Ontario well in the lead. In factory butter, as it is termed, however, Quebec far exceeds Ontario. Whereas only one-fifth of Ontario's 17 millions dollars' worth of butter is the product of factories, two-thirds of Quebec total output of about 14½ millions dollars' worth is made in this way. The output and export of cheese is decreasing materially in both provinces while butter is being produced in larger quantities, a favorable tendency for live stock development.

Homemade butter is made in smaller quantity in Quebec than in Ontario but the output is increasing somewhat. Homemade cheese is still a product in both provinces but an insignificant one and one which is decreasing yearly. Much more was made 20 years ago.

Wool

Wool forms another important animal product. Here Quebec occupies a position similar to the one she holds in sheep. Production has been decreasing until recently. From 1901 to 1911 her output decreased 31.42%, but in spite of this the value increased from $570,033 to $659,931 or 15.76%. In Ontario, in spite of the increased price of wool, the total value decreased 21.27%.

LIVE STOCK IMPROVEMENT

Every year sees Quebec farmers more dependent upon animals and animal products as the main source of returns. This is probably true of all the provinces, but it has a special application to Quebec and this is being appreciated to some extent at least. Various agencies, including private enterprise and Government aid, are extremely active at present and there is good reason to

---

the most careful attention, has been developed and dropped to the ground. Only a few such overlooked seeds will be sufficient to start a weed crop which very soon will prove detrimental to a well-managed farm.

The seed of sweet clover is very similar to alfalfa seed, in fact so similar to it in general appearance that even experienced seed analysts often fail to detect it when mixed in with alfalfa. This being the case, the alfalfa seed growers, it may be unknowingly, may put on the market alfalfa seed contaminated with sweet clover. That 'accidents' of this kind must necessarily hurt the reputation of the whole seed-growing district and the alfalfa seed industry of Canada in general needs no special explanation.

The danger of getting alfalfa infested with sweet clover is especially grave in irrigated districts. It will grow abundantly and luxuriantly along the irrigation ditches, and produce large quantities of seed which will be dropped into the ditches and carried by the water all over the irrigated area. The rapid spreading through the irrigating waters has caused a number of the irrigated States in the American west to look upon sweet clover as a troublesome weed.

believe that the quality of live stock in Quebec will very soon show material improvement.

In fact within the last year or two it has been noticeable in the stockyards. Reports just received from a number of the packing houses in Montreal are unanimous in noting improvement in stock from Quebec. We shall have plenty of latitude for some time, but this makes the opportunity all the greater.

Organizations

There are various live stock organizations within the province, some of which merit special mention:—

Through the Association known as "The General Stock Breeders' Association" and with the help of the Provincial Dept. of Agriculture, public sales of pure-bred stock have been held at Montreal and Quebec during the last three years. It is thought that by means of these sales more general use of pure-breds would be made and for breeder and customer selling and purchasing would be much facilitated. These sales are conducted to good advantage through a great many smaller organizations known as "Farmers' Clubs". There are nearly 700 of these in the Province with over 62,000 members and receiving Government grants. These, together with stock breeding syndicates which are also controlled by the Government, are undoubtedly good channels for the distribution and use of a great many pure-bred sires in various sections throughout the province. Through these, as well, it is possible to exert a definite influence in directing the stock-breeding policy in many of the communities.

Pure Bred Stock

As many an Ontario farmer can testify, Quebec has been a ready market and a fine field for Ontario breeders for some time.

For the above sales for instance a very considerable part of the stock was obtained in Ontario, especially in the case of the first two sales.

For the most part this has been a good thing for both provinces but such a policy has had its drawbacks from a Quebec standpoint. It might be said that our farmers in Quebec formed the purchasing habit rather than the breeding one. This I hope to have some small share in correcting. Again there has been too much long-distance purchasing, and too often the Ontario breeder has not displayed sufficient interest in later trade or sufficient respect for the judgement of the man in Quebec. This has been remedied to some extent but the impression in Ontario needs still further correction. We still must come to Ontario, and probably will come for some time, for we have a rapidly growing trade, and, moreover, it would not be wise to limit the source of improvement stock by boundaries, but I take the same stand between provinces as I do between countries. Import or exchange trade has a place, but there is no earthly reason why we cannot produce the best in this country or why Quebec cannot do her own breeding in a larger measure. With more good breeding in each province the interprovincial trade will be in higher class stock and that is as it should be.

WHAT THE PURE-BRED CENSUS REVEALS

Viewing the pure-bred situation from a statistical and breed point of view I find that Quebec, in general, occupies a position of mediocrity. In no case is she a leader of the Provinces and in no case is she a tail-ender.

Horses

In the case of Quebec 0.96% of her Horses are pure-bred. Ontario being first with about double the proportion, British Columbia second, Manitoba third, Alberta fourth and Quebec fifth. Standard-breds are about equally prominent in the two provinces. French Canadians and Ardennais are features in Quebec's horse population and not in that of any other province. Clydes are also well to the front, as they are in all the leading provinces.

Cattle

Quebec stands second in total numbers of pure-bred cattle, with 18,160 head. This is, however, only 1.25% of her total number of cattle. Manitoba, Ontario and British Columbia have nearly twice this percentage of pure-breds. In this class Quebec makes her best showing, and especially in dairy cattle where Ayrshires and French Canadians give her a tremendous advantage. Holsteins and Shorthorns are also important factors.

Sheep

In sheep it has already been remarked Quebec promises well at the present time. When it comes to pure-bred stock Ontario, with 40,983 head or 5.51% of pure-breds, is far in the lead. Quebec, while far behind Ontario, is much ahead of the other provinces with 6122 head. This, however, is an inadequate number and in percentage drops to where we found it in horses, viz. 0.16%.—a percentage only one-sixth that in Ontario (5.51) , one-fourth that in Manitoba and one-third that in British Columbia. Leicesters are the most popular breed in Quebec, although the Shropshires make a good second. Oxfords and Cotswolds, two strong breeds in the Dominion, are fairly popular but much below Leicesters and Shrops in numbers. In view of the promised expansion in sheep and the present low proportion of pure-bred, it would seem reasonable to expect activity in this field.

Swine

In swine Quebec with 8,284 head and 1.04% of pure-breds is again second but much below Ontario with its 30,853 head and 1.11%. Yorkshires lead all other breeds in Quebec as they do in all other provinces and this can be said of no other breed for its particular class. Conspicuous in pure-breds in Quebec stand the Chester-Whites. Here, comparatively speaking, the Chester-White enjoys his greatest popularity. Tamworths and Berkshires are also well represented.

Imported Stock

In the matter of imported stock—which in some breeds is regarded by many as the great source of improvement—Quebec in 1913 took a liberal share especially in the classes which concern her most. Part of these no doubt were not retained in the Province, but this is true of other provinces as well. Exclusive of Holstein Cattle, for which I have not figures at hand, 14.6% of all importations came to Quebec. She was particularly prominent in Ayrshire Cattle. Sheep, Clydesdale and Standard-Bred Horses. Ninety-five percent of the Ayrshires imported, sixty-four percent of the Gueernseys, twenty-seven percent of the sheep and over twenty percent of the Hackney, Standard-Bred and Thoroughbred horses came to this province.

POSSIBILITIES

Some phases of the situation which might come under the heading 'possibilities' have already been dealt with. These I shall try to summarize and correlate with other considerations.

Thus far I have made no mention of the situation as affected by the war. In this connection speculation is rife at the moment and some very fantastical ideas are afloat. We have reason to believe that in Europe the farming population is being depleted, a great many horses are being killed, breeding operations and the production of animal products are seriously disturbed, and a great deal of money is being spent—all of which have direct bearing on live stock. It would seem reasonable to assume that in general an increased demand for live stock and animal products will be the outcome, but what specific forms and development it may take must be difficult for any one to predict. This much is true, we have more good outlets at present than we are using, and the future is full of promise for live stock.

Quebec is in a good position to forge ahead. She has a large territory of land, each year adding to her improved proportion. Her rural population is increasing somewhat and I think it can be said that the sentiment of the average farmer is keener in live stock improvement at present than has been the case for some time past. The numbers and value of live stock are increasing in total and per farm, but she has not only room but urgent need for more and better stock on much of her older land. Two features deserving of special effort on their behalf are dairy cattle and sheep. In the former she is already strong but she could well be much stronger. In the latter, sheep, the field is practically unlimited. For her large numbers of animals, she has a good percentage of what might be termed improvement stock but with the growing need for more good stock and with the help of the various agencies at work she should be able to move rapidly in this field. It might be said that with the immense numbers of ordinary commercial stock on which to use pure-breds she has an almost unequalled opportunity to show large results and consequently a big opportunity for the too little explored field of home breeding.

The commercial home market in Quebec ranks with the best, but the outlet beyond this is something not fully appreciated as yet. In a number of ways no other province is situated quite so advantageously as Quebec for external trade. Two chief factors, shipping facilities and proximity to market, whether it be the Eastern cities in the United States or ocean export trade, are in her favor.

Thus, to sum up the various aspects of the situation, Quebec's opportunity as a live stock province cannot be denied, it is with her at present; she has done considerable in the past, but she should be capable of a great deal more in the future.

H. BARTON

BUILDING UP THE DAIRY HERD

FOR the average farmer who cannot afford to have all his herd pure-breds, we should advise the use of a pure-bred bull of whatever breed is best adapted for the conditions under which the animals are to be used, writes Prof. H. H. Dean. Having decided on the breed, do not mix dairy breeds. Stick to the one breed and select the best animals. Farmers might co-operate in the purchase of a pure-bred bull for use in the locality. Farmers' institutes and farmers' clubs and agricultural societies might start this work among members at small cost. Bull associations have been successful in Denmark. The use of the "scrub" or beef bull in dairy sections has been one of the greatest hindrances to the development and improvement of dairy herds. Under no circumstances should such a bull be used where heifers are reared for increasing or replenishing the dairy herd, as they are not paying propositions as a rule.

When selecting a dairy sire, get a good representative of the breed, out of a milking family with the upward principle; look for masculinity, prepotency, good health, good development in the region where the udder of the cow is located, skin loose and rudimentaries large and well placed. Use an aged, tested bull in preference to a young untried animal. Such can often be purchased cheaply when the owner desires to avoid in-breeding. Be careful, however, to see that he is free from disease, a "sure-getter-in-calf" and that he is not ugly. Animals mated should be healthy, of suitable age, size and disposition. In-breeding may be followed for at least one generation. As a rule our breeders have been too much afraid of this. We need also to bear in mind that ability to perform, and power to transmit that quality, are two entirely separate functions. This fact overlooked has caused much disappointment and loss to breeders of dairy stock.

Eliminate all animals than do not come up to the minimum standard of 6,000 lbs. milk or 250 lbs. of butter in a year. In the case of pure-bred cattle, it is also advisable to sacrifice all those animals of undesirable form, color and characteristics, but great care should be exercised not to sacrifice utility or dairy qualities for the sake of some fad in form or color. Uniform size, color, and general outlines are much admired and desired in a dairy herd, but it is possible to go to extremes on this point. Use the scales and tests for fat, or fat and casein, and rely on these more than upon the eye and hand when building up a dairy herd.

THE "SINGLE-CROP" DAIRYMAN

DID you ever hear of the "single-crop" dairyman? The single crop wheat farmer, cotton planter, and tobacco grower have been very much discussed and from every hand diversification has been advocated. But what about the "single-crop" dairyman, the man who has nothing to sell but milk for the market, who scorns the calf, depends upon the stock dealer for his fresh cows, and the feed dealer for the bulk of his feed ?

Is he any more intelligent in his operations than the wheat grower or the cotton grower ? We think not. It is barely possible that he shows even less business sense than they, for with his greater opportunities to become a real high class farmer, he fritters his chance away.

The production of milk for market, like wheat or cotton growing, is an honorable business. We must have milk, and wheat, and cotton, but why should the production of these crops destroy all sense of proportion and make the producer a slave to one idea ?

On the average milk farm furnishing milk to contractors in our large cities, the farmer, as a rule, (there are exceptions) does not study his soil and the possibility of making it produce his feed. He goes to the feed store; that is easier. It requires less planning and thinking. At the feed store he buys ready mixed feeds because it requires less planning and thinking. Now feed stores and ready mixed feeds are a necessity and when rightly patronized are a great convenience and often a time and money saver. What we are here trying to get at is the man who does not use these things with intelligence, the man who does not think, the man who does these things because by doing so he is following the line of least resistance. Such a man, dependent though he is on the feed store and ready mixed feeds, is not as good a customer of these places as the man who thinks and has a thorough understanding of what he does.

This type of dairyman goes to the cow dealer and buys fresh cows. This also requires less planning and thinking. He sells any calves he may have to the butcher and sends the dry cows to the butcher because it requires less planning and thinking. He sells his interest in the local creamery or cheese factory because by simply signing a contract for his milk every six months it relieves him of the necessity of planning and thinking about his creamery or cheese factory.

Presently he finds himself swapping his milk checks for feed bills. Somebody makes an investigation and shows that it is costing him more to produce milk than he is getting for it and a fight is on for better prices.

On this point Hoard's Dairyman has no quarrel. The dairyman should get better prices than he is getting in most of the territory tributary to our large cities. But this we claim:—the farmer who has followed the "one-crop" milk idea has something more fundamentally wrong with him than prices. The deadening effect of following one idea has placed him where prices will not help him, no matter how much they may be boosted. This we believe to be a fact that cannot be controverted.

The man who has bred his own milking herd and is growing as far as possible his own feeds, who has a surplus of stock to sell, is producing milk to-day as cheaply as it was ever produced. Feed and labor have advanced in price, it is true, but so has the skill of the wide-awake dairyman, until his herd is producing with greater efficiency and his soil is growing greater and better crops for his herd. This man, instead of finding the present conditions grinding him down, is getting a greater profit than ever from his dairy farm.

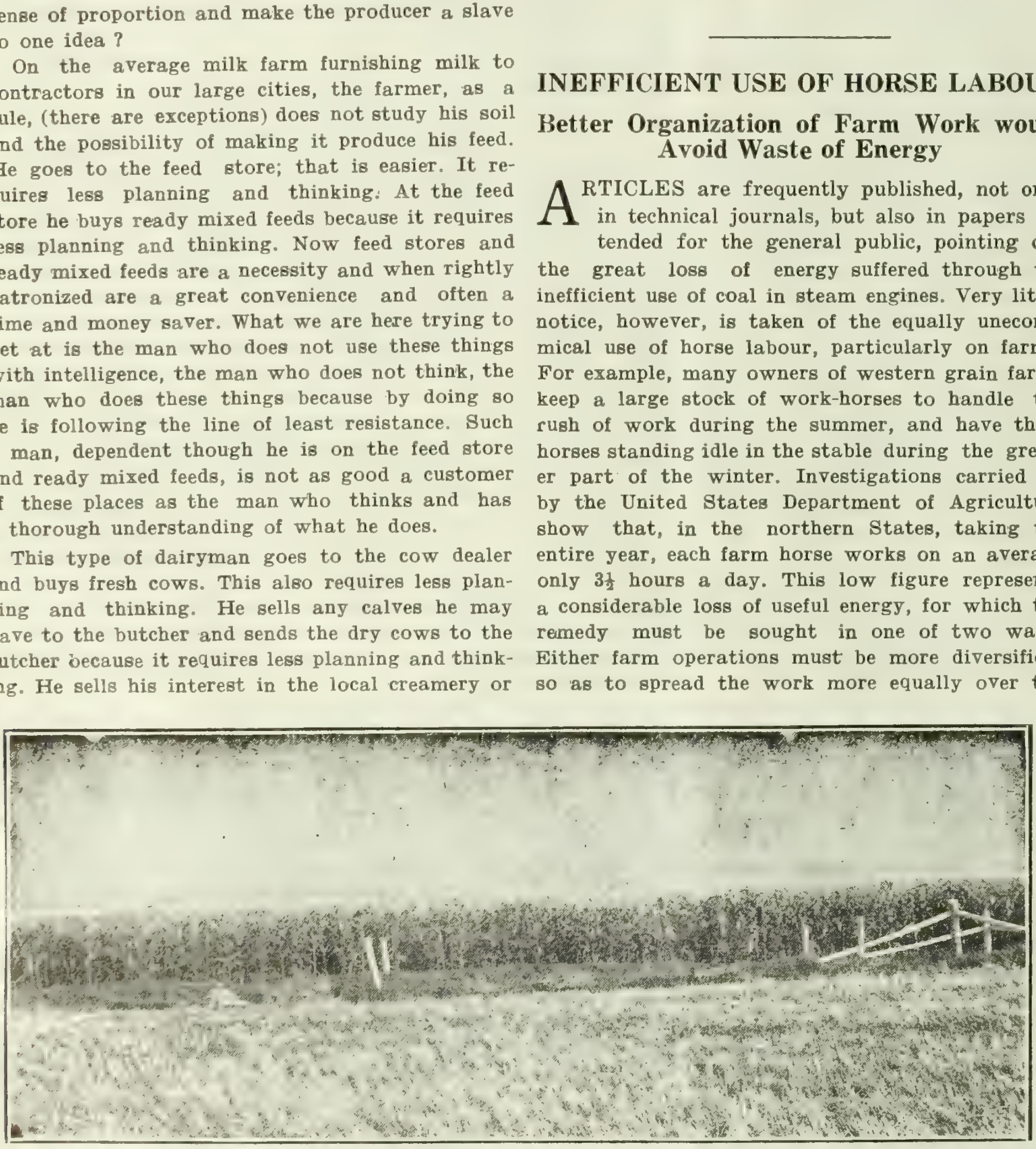
The "one-crop" dairyman, like the wheat or cotton farmer who puts all his eggs in one basket and has but one outlet for his crops, is the lowest type of dairyman. He can change his condition if he will. Will he ?

Hoard's Dairyman

INEFFICIENT USE OF HORSE LABOUR

Better Organization of Farm Work would Avoid Waste of Energy

ARTICLES are frequently published, not only in technical journals, but also in papers intended for the general public, pointing out the great loss of energy suffered through the inefficient use of coal in steam engines. Very little notice, however, is taken of the equally uneconomical use of horse labour, particularly on farms. For example, many owners of western grain farms keep a large stock of work-horses to handle the rush of work during the summer, and have these horses standing idle in the stable during the greater part of the winter. Investigations carried on by the United States Department of Agriculture show that, in the northern States, taking the entire year, each farm horse works on an average only 3½ hours a day. This low figure represents a considerable loss of useful energy, for which the remedy must be sought in one of two ways. Either farm operations must be more diversified, so as to spread the work more equally over the year and make it possible to reduce the stock of working horses, or machinery must be substituted for horse power to a much greater extent than at present. Every horse-owner is entitled to expect, and to strive to attain, a satisfactory return from his investment in horse flesh. The right way to do this is not to overwork the horses, but to put more brains into his business, so that, as far as possible, no horse may be idle for any lengthy period, nor yet have to work overtime during rush seasons.—*Conservation.*



A fine field of Silage Corn in Quebec.—A dairyman or feeder has no fear of winter famine when he has silos full of silage.

SWINE FEEDING

THERE is probably no class of live stock that offers greater returns upon the investment than hogs, and it has been proven by many farmers, especially in dairy districts, that hog raising is one of the necessary adjuncts to any general farming or live stock business if the fullest profits are to be realized. On every farm we find an abundance of waste material and by-products which if handled carefully will add to the general revenue, and the hog offers this income. Its products are of high value and quality, and demand a ready market throughout the year.

The increasing value of land, food-stuffs and labor is making it necessary for the feeder to economize, as far as possible, in the use of high-priced foods and depend upon farm by-products and crops as his main supply, and if we note the feeding methods of the pork-producers who are making the most of this end of the farm, we will find them depending largely upon such a system.

When the young pigs are on the sow is the period when the greatest and most economical gains can be had. The development at this stage governs the progress of that later and determines the age at which the hogs will be mature and ready for market. Feeding the sow a scanty ration and expecting a well-developed litter is losing sight of the goal. After the pigs are born the feed of the mother for at least 48 hours should be of a light, easily digested and laxative nature with the purpose of warding off milk-fever and allied troubles. Tepid water and skim-milk with a little bran, shorts or oatmeal siftings mixed in is all that is necessary, if the sow is in a fair condition. If she is sick or constipated, linseed meal, mixed in light quantities with the water or skim-milk, will under normal conditions restore health and vigor. The quantity of feed should then be increased until she is taking all she will readily have of skim-milk and shorts or ground oats, or better shorts and ground oats mixed in equal proportions by weight. Such feeding will allow the sow to gradually develop full milk flow as the pigs come to need it. After the first two weeks, a slight amount of barley may be added, but if added earlier or in too great quantities the result is noticeable in an unthrifty condition of the pigs and congested milk flow of the sow. This is due to the "heating effect" of highly carbonaceous foods as barley and corn.

When two or three weeks old, the unweaned pigs should be encouraged to eat by supplying thin food in a shallow trough, which cannot be reached by the sow. Skim-milk with wheat middlings or oatmeal siftings (ground oats with the hulls sifted out) mixed in will be of high value. This relieves the heavy burden of the sow, especially if the litter is large, and gives returns in faster growth and higher gains of the pigs. It also assists in preparing the litter for weaning by making them self-reliant.

The usual weaning period is when the pigs are seven to ten weeks old. If the sow is young or a large litter is being improperly nourished, seven to eight weeks is long enough to have them sucking. Otherwise they may be left longer.

If the pigs have been taught to eat, they will need no extra care in feeding at time of weaning, but if not, great care must be exercised. The same

It is a kindness to a horse to be allowed to walk without reins or lines. A horse can soon be trained to walk without reins.

feeds, as advised, may be used and if fed judiciously will start the youngsters in the right direction Overfeeding will tend to stunt, as well as underfeeding, but if the pigs are kept satisfied with nutritious foods and always ready for the next meal no evil effects will occur. After weaning the ration gradually reached should be of a bulky protein nature to develop the digestive system and promote the growth of muscle and bone. No line of foods offer bulk and nutrition in combination equal to the clovers, rape or even pasture grass. The shotes should have a run and variety of these if possible, such as may be grown in rotation in plots sown for the purpose. The other part of the ration can consist of skim-milk, shorts, and oatmeal siftings, until the pigs are three months old. After this the skim-milk may be left out unless an abundance of it is on hand. The grains would then consist of a mixture of 2 of shorts, 2 of ground oats, and ½ of peas by weight, and water or whey could be used in the place of skim-milk. At three and one half months old, barley could take the place of a part of the oats. Then at four months the ration would be 1½ shorts, 1 of peas and 1 of barley by weight. The object of the change from oats to barley is to begin a gradual change from a highly nitrogenous ration (muscle and bone building) to a carbonaceous one (flesh or fat forming), thus gradually bringing the hogs to market condition and maturity without abrupt changes in feeds.

At four and one half months of age more barley could be added gradually and at five months a ration of two of shorts, one and a half of barley, two of peas, with a slight amount of corn will meet all demands. The corn will then gradually replace a part of the barley and the shorts may be omitted at about the age of five and one half months. After this age the ration will gradually assume a finishing quality, for example one of corn, and one of peas, until at six months or shortly after the pigs are fit for market.

Such a system of feeding gradually brings the pigs from the weaning point to market by first forming the frame or foundation from the protein foods such as shorts, peas, and skim-milk, then develops the flesh later. The feeds adopted are those which any feeder can procure, but may be changed to suit conditions. Shorts have the advantage of being easily digested and adding bulk to the ration, but might be left out earlier. Peas might be substituted by gluten meal. Feeding flour will take the place of barley, but it is of a more concentrated nature and need not be fed in such large quantities.

Many combinations and systems of feeding are being recommended and the feeder is justified in using them if they are cheap, gradually develop the animal toward market, and include a pasture as a means of giving exercise and green food for the hogs. In winter large quarters and roots will supply these last requisites.

W. J. REID,

Instructor of Animal Husbandry, P. E. Island

A 30,000-lb. DAIRY COW

THE 30,000-lb. dairy cow has arrived in the person of the Holstein, Tilly Alcartra, owned by A. W. Morris and Sons of California. On the evening of November 13th 1914, this cow finished a year of semi-official test-work with a production of 30,452.6 pounds of milk containing 951.3 pounds of butter fat, thereby becoming the world's champion milk cow.

Regarding the feed consumed during the test, Hoard's Dairyman gives the following facts. "In producing a world's record of milk production, Tilly Alcartra consumed a generous quantity of well apportioned feeds, although she is not as heavy a feeder as might be supposed from her great production. She showed an especial fondness for stock beets, and these with dried beet pulp and corn silage contributed the succulence to her ration. Her grain ration was a mixture of one part barley, one part oats, and one part bran. During the year an accurate account was kept of her feed and its cost, and the following table shows her board bill:

Feed and cost per ton	*Cost of feed*
1828 lbs oats @ $30	$27.42
1828 lbs. barley @ $23	21.02
1828 lbs. bran @ $27.50	25.13
1208 lbs. linseed oil meal @ $34	20.54
681½ lbs. dried beet pulp @ $22	7.50
3226 lbs. corn silage @ $2	3.23
10122 lbs. hay ½ $5	25.31
15140 lbs. beets @ $2.50	18.92
Total cost of feed	$149.07

Figuring Tilly Alcartra simply as a profit maker from milk production, makes her a very valuable cow. Reduced to quarts her year's production equals 14,164, and figuring the value of the milk at four cents per quart gives her a credit of $566.56 for the year, or a margin of $417.49 over her feed.

DEPLORABLE SCARCITY OF SHEEP IN CANADA

TWO good owes are better than nine or ten scrub ones. With them use of a good sire, and breed with the idea of producing mutton. This is a rule which if generally followed on every Ontario farm would result in the restoration of sheep to their place on Canadian farms, from which they had fallen of recent years, and at the same time would work wonders on the farms by clearing them of weeds.

R. Harding, of Thorndale, preached "Sheep" during one of the lecture hours at the Winter Fair, Guelph. Commenting on the general custom of "going out of sheep," he said, "Following the crowd is all right, if you know when to stop." The inference was that the present time was the right one to show a little originality and get back into sheep again. Every farm should have a small flock, he said, and the sheep would clean up ninety per cent. of the weeds. Another feature which should induce men to go into sheep raising more, was the shortage in wool which faces the world, said Mr. Harding.

In handling the sheep, dipping is necessary, and more mature sires should be used. Too often the breeder is satisfied to use an undeveloped ram lamb, from which he can not hope to get vitally strong and healthy lambs. Yearlings of aged rams should always be used.

In closing, he advised the man who has had no experience with sheep to start slowly and gradually develop his flock, as there will certainly be difficulties and discouragements, as surely as there will be in other lines.

"How about dogs?" the question was asked the speaker as he was about to sit down. He believed that for one man who was ever bothered by dogs in his flocks there were ten men who never had any trouble at all. This trouble would be even less if the dog tax and regulations were strictly enforced. If trouble were really experienced it would not be very expensive to closely fence off a small area close to the house into which the sheep could be trained to come at night, and where they would be immune from attacks by wandering dobs.

Weekly Sun

METROPOLITAN LIVE STOCK BREEDERS' ASSOCIATION

To Work Co-operatively.—Business Men of Montreal Organise to Promote Live Stock Production.—Aim to Establish Standards for Food Products and Eliminate Waste.

AN association was formed early last spring by a number of Monteal business men personally interested in agriculture in the Island of Montreal, to enable them to work co-operatively, to be a help to each other and to the farm development in the province as a whole. The name chosen was The Metropolitan Live Stock Breeders' Essociation, having as its aim and object the breeding of high grade pure stock for distribution, and the holding of an annual fair, which would take the form of an agricultural exhibition in its purest and simplest form.

Errangements were made for holding the first exhibition at Macdonald College, where the use of the buildings and equipment had been offered, but it was later thought advisable on account of the war to postpone the exhibition until another time. Those connected with the organization felt, however, that it would be well to hold meetings from time to time, discuss the general situation of the province be in a position to make helpful suggestions to the farmers.

Et a recent meeting, the association had the Hon. Jos. E. Caron and several prominent Montreal men as its guests. Sir H. Montagu Allan, president of the association, was in the chair, and others present were: Sir Hugh Graham, Alfred

Price, W. T. Rodden, T. B. Macaulay, R. G. Chamberlain, G. H. Montgomery, Col. Labelle, C. J. Smith, W. A. Cooper, James R. Nelson, Harold Morgan and John I. Brown, secretary.

Sir Montagu Allan spoke briefly of the aims and objects of the association, and said he felt sure its work would be profitable if operations could be carried out along proper lines. He welcomed Mr. Caron, and asked John I. Brown to deal with a few of the plans relative to the organization.

Mr. Brown emphasized the value of such mettings to business men. Many thousands of dollars had been spent by both the federal and local governments in educational effort and the results, while productive of enough good to wrrant the expenditure, had not accomplished all that was desired. The Government's aim had been to put clearly before the farmers and producers the needs or requirements of the best markets, and he felt it was their duty to tell them how to produce the commodities in question. Valuable work had been done by experimental farms by Dominion and Provincial Governments. The efforts of the governments had been largely, if not altogether, directed to aid the producer; but the utter lack of any effort to help the consumer made it a slow, difficult, and in many cases, an impossible, task to gain the desired end.

A standardization of food products would help to reduce the high cost of living, which was caused by waste more than any other one factor. There was a great opportunity to develop export business and bring a wave of prosperity to the country.

The Hon. Jos. E. Caron complimented the association on the work it was doing, and said his department was ready and willing to help in any way possible. The work accomplished by the Department of Agriculture through practical men in the field, to demonstrate proper methods of marketing and manufacturing, had already make a name for the province in many lines. He cited the exhibits of cheese and butter at Toronto, and Ottawa exhibitions as evidence of this, saying a very large proportion of honors came to the Province of Quebec.

Mr. Caron made a strong point of the fact that any help given to the farmer would be an indirect benefit to all other factions in the trading community, and urged the association to continue its good work.

T. B. Macaulay spoke of conditions in western Canada and said what was needed in Quebec was practical education for the farmer to enable him to increase production, eliminate waste and produce the goods for which there was the best market.

W. T. Rodden advocated the establishment of demonstration farms where young men could be trained in practical work, and thereby become available for the farms owned by such men as were present at the meeting. From figures compiled from his own farm, Mr. Rodden showed that farming could be made to pay when proper steps were taken to have the land properly untaken to have the land properly underdrained, cultivated and fertilized.—*Weekly Star.*

OFFICIAL RECORDS OF HOLSTEIN-FRIESIAN COWS

From November 1st to November 30th, 1914.

No. and Name of Cow	AGE y..	m.	.d.	Milk Lbs.	Fat Lbs.	Butter Lbs. 80% Fat	OWNER
MATURE CLASS							
1. Lily Artis Burke 8825	7	7	2	501.1	17.50	21.88	S. J. Foster, Bloomfield, Ont.
2. Toitilla of Riverside 12254	5	7	3	416.8	14.44	18.06	Joseph O'Reilly, Ennismore, Ont.
SENIOR FOUR YEAR OLD CLASS							
1. Ardelia DeKol Eensen 13700	4	10	23	513.9	20.05	25.06	D.C. Flatt & Son, Hamilton, Ont.
SENIOR THREE YEAR OLD CLASS							
1. Fairview Korndyke Boon Johanna 18028	3	7	8	462.9	18.27	22.84	Dr. L. De L. Harwood, Vaudreuil, Que.
2. Shadelawn Tidy Canary 19266.	3	6	29	388.9	14.12	17.65	T. L. Dunkin, Norwich, Ont.
3. Lakeview Rattler 2nd 16733	3	6	8	453.8	13.71	17.14	Lakeview Farm, Bronte, Ont.
JUNIOR THREE YEAR OLD CLASS							
1. Lady Pietje Canary's Jewel 17314 120-day record	3	4	10	10042.7	376.68	470.85	
150-day record				12085.9	456.49	570.61	J. M. Steves, Steveston, B.C.
SENIOR TWO YEAR OLD CLASS							
1. Helena Burke Keyes 21369	2	8	1	326.2	13.78	17.22	A. D. Foster, Bloomfield, Ont.
2. Mildred Pietertje Abbekerk 21509	2	7	15	450.7	13.631	17.04	Dr. L. De L. Harwood, Vaudreuil, Que.
3. Mutual Pauline Patti 23183	2	7	12	336.6	12.80	16.00	R. M. Holtby, Port Perry, Ont.
4. Ina Tritom Canary 24118	2	6	6	324.4	9.78	12.23	T. L. Dunkin, Norwick, Ont.
5. Hill-Crest Pontiac Duchess 22714	2	6	6	254.0	9.39	11.74	Geo. Smith, Port Perry, Ont.
6. Shadelawn Gerben 2nd's Canary 24116	2	7	15	420.7	13.63	17.04	Dr. L. De L. Harwood, Vau-
JUNIOR TWO YEAR OLD CLASS							
1. Artis Burke Sylvia 24707	2	4	28	336.9	11.60	14.50	S. J. Foster, Bloomfield, Ont.
2. Fayne Segis DeKol 21638	2	0	17	339.5	10.84	13.55	R. M. Holtby, Port Perry, Ont.
3. Pontiac Roxie 23022	2	2	2	277.4	9.01	11.27	Dr. L. De L. Harwood, Vaudreuil, Que.
4. Bonnie Lassie Canary 24117	2	5	25	313.4	9.98	11.22	T. L. Dunkin, Norwich, Ont.
5. Shadelawn Lillie Canary 24124.	2	2	9	261.3	8.55	10.68	T. L. Dunkin, Norwich, Ont.

Reports of the official tests of eighteen cows and heifers were received and accepted during the month of November. The most noteworthy are those for Ardelia DeKol Tensen, with 25.06 lbs. of butter in 7 days, and for Lady Pietje Canary's Jewel, with 570.61 pounds butter in 150 days as a Junior three-year-old. The record of the latter heifer is unequalled, in Canada at least.

W. A. CLEMONS, Secretary.

SEMI-OFFICIAL RECORDS OF HOLSTEIN-FRIESIAN COWS

From November 1st to November 30th, 1914.

Number and Name of Cow	Yrs. AGE	Days	Lbs. Milk	Fat Lbs.	Butter Lbs. 80% Fat	OWNER
MATURE CLASS						
1. Mary F. Netherland 2nd 7676.	7	78	12941	457	571.25	Roy Nevill, Straffordville, Ont.
2. Madame B. 3rd's Princess DeKol 12705	8		13000	406	507.5	W. F. Walker, Manchester, Ont.
FOUR YEAR OLD CLASS						
1. Hulda Wayne Lady Posch 12814	4	129	11318	404	505.	John C. Brown, Stamford, Ont.
2. Bess DeKol Schuiling 11678	4	100	13370	403	503.75	John C. Brown, Stamford, Ont.
3. Princess Jane of Sunnyside 11182	4	345	12294	363	453.75	J. S. Honey, Cherrywood, Ont.
TWO YEAR OLD CLASS						
1. Daisy Johanna Ormsby 18324..	2	14	9285	326	407.5	Dir. Exp. Farms, Lacombe, Alta.

Six semi-official records have been reported during the month of November. While all are creditable there is nothing of outstanding merit.

W. A. CLEMONS, Secretary.

HUNGRY FOR HOLSTEINS IN ENGLAND

Surrey was the venue of a remarkable sale of cattle on November 9th. It was run by the British Holstein Cattle Society, who made a profit of £10,000 on the day's deal, and realized for 59 head a sum of £14,936 5s. It arose this way. There is a bar up in Britain, a bar made by the Goverment against imported cattle, but to oblige a few zealous lovers of Friesian cattle, called Holstein in Britain, the Government allowed 59 head to come into the country from Holland, spend a three months' quarantine at the docks, and then be dispersed. Only 300 people visited the sale, held by John Thornton & Co., Frank Matthews the Shorthorn salesman being in command. The 59 head were composed of bull calves, chiefly, and very young heifers. Two bull calves sold for 560 guineas; two for 520 guineas; one for 500 guineas, and so on down the sale. The least figure paid was 110 guineas. In heifers best price was 520 guineas, and least 105 guineas. Not a lot realized lest than 100 guineas—a wonderful accomplishment. The 59 head averaged £253 3s. 1d., or an aggregate of £14,936. The 39 bulls averaged £257 13s., and the 20 heifers £244 7s. 9d.

A novelty was to state in the catalogue what the animal cost. I have figured out that the British Holstein Cattle Society have cleared £10,000 in one day. Never has an obscure Society leaped to fame in one short 24 hours. One will have to take his hat off to the Secretary nowadays when he talks to him—fancy £10,000 in one afternoon.

G. T. Burrows, Surrey, England,
In Farmer's Advocate.

THE DAIRY

THE MILK SUPPLY OF MONTREAL

THE recently published bulletin of Principal Harrison, Dr. Savage and Mr. Sadler, of Macdonald College contains so much of vital importance to the dairy farmers of the province that a complete account of the work cannot well be given within the limits of a single article. The investigation described in the bulletin comprehended a thorough bacteriological analysis of about 1200 samples of milk. Of these, 285 were collected in the country, either at the farms or from cans at the railway stations, collecting stations and creameries. All these rural samples were taken under summer conditions. In the city samples were collected from the delivery carts on the street, from grocery stores, restaurants, lunch rooms, dining rooms and cafes, and from the establishments of the six largest wholesale dealers. The number of samples collected in the city under summer conditions was 577, and under winter conditions 312.

These samples were graded according to the number of bacteria found and according to the number of "colon" and "liquefier" organisms among these bacteria, the "colon" and "liquefier" groups being characteristic of manurial impurities in the milk. The system of grading was as follows—

Bacteriological Grading of Milk

Maximum number of bacteria allowed per cubic centimetre.

Grade	Total			Colon		Liquifier	
	In unpasteurised milk.	Before pasteurising	After pasteurising	Before pasteurising	After pasteurising	Before pasteurising	After pasteurising
A.	100,000	200,000	10,000	500	0	2,000	500
B.	1,000,000	1,000,000	50,000	5,000	0	20,000	5,000
C.	5,000,000	5,000,000	100,000	10,000	0	100,000	50,000
D.	All below grade C.						

The American "Commission on Milk Standards" which established these grades (except D) for the total number of bacteria, recommends that milk of their grade C., i. e. all milk below grade B, should be used for cooking or manufacturing purposes only. The Macdonald College investigators in adding Grade D, *five times worse than Grade C*, express the opinion that milk of this grade should not be sold for human food.

The cities of Chicago and Rochester require milk to be of Grade A. Boston has a standard of 500,000 bacteria per cubic centimetre, which means that only Grade A. and the better samples of Grade B. may be sold. New York allows only 60,000 bacteria per cubic centimetre in inspected milk, i.e. high-class Grade A, and 50,000 per cubic centimetre in pasteurised milk, i.e. Grade B.

Now, the results of the investigation of Montreal milk may be summarized in percentages as follows:—

Grade.	Rural Samples. Summer.		City Samples. Summer		City Samples. Winter.		Grade signifies.
A.	9.5	46.	2.1	9.6	3.5	18.6	Unexceptionable.
B.	36.5		7.5		15.1		Passable.
C.	33.7	54.	21.0	90.4	13.1	81.4	Fit for cooking only.
D.	20.3		69.4		68.3		Unfit for food.

It follows that ninety per cent of the milk delivered to consumers in Montreal in the summer and over eighty per cent of that delivered in the winter would be condemned in any of the United States cities referred to above. Such milk—milk of Grades C and D—is unfit to be fed to children. Furthermore, it is the opinion of the Macdonald College investigators that over two thirds of the milk delivered to the Montreal consumers both in winter and in summer is *unfit for use as human food at all*, and should be confiscated.

Of course the dairy farmer cannot be charged with responsibility for the condition of the milk as received by the consumer 24 to 30 hours after it is drawn from the cow. It not only may, but *does*, deteriorate greatly after leaving the farmer's hands. But it will be noted that *one-fifth* of the summer milk is *unfit for use as food when it leaves the farmer's hands. Over one half* of it is unfit for use as children's food, and *nine-tenths* of it is below the Chicago and Rochester standards when it leaves the farmers' hands. In making these estimates we are, of course, assuming that the whole of the milk shipped would average like that actually sampled. This may be inexact, but we have no other data to guide us—except the report of the Food Inspection Division of the Health Department of the City of Montreal.

This report on the condition of the stables lends support to the view that most of the milk produced must necessarily be of poor quality from the sanitary standpoint. Half the stables are pronounced dirty, two thirds insufficiently lighted, three fourths undrained and nine tenths insufficiently ventilated. Less than half of the farmers had ice, less than one third had suitable dairies and over ten per cent of the herds were infected with tuberculosis. None of the railway stations had provision for keeping the milk cool while waiting for the train and none of the milk-trains were provided with refrigerator cars. When we add to these unfortunate rural conditions the shocking ignorance and carelessness of the urban handlers of milk, we can scarcely wonder that the average of all the city milk sampled showed a bacterial count of 20,000 per cubic centimètre in the summer, and 5,000,000 per cubic centimetre in the winter. This is Grade D. milk even in winter, and the high colon count in the winter (500,000 per cubic centimetre) and the high liquefier content in the summer (1,000,000 per cubic centimetre) indicate clearly that much of the contamination originates in the stable.

Samples obtained from nine farmers equipped with milking machines were found to be worse, rather than better, than hand-drawn milk from the same neighborhood. The nine samples averaged Grade B in total bacteria but Grade C in colon count and Grade D. in liquefier count.

In reference to the economic aspect of the question, the investigators say:—

Too much emphasis cannot be laid upon the fact that the farmer is given no extra remuneration for the care he may exercise to produce pure milk.

Although practically all farm produce is paid for according to quality, we find that milk is an exception. Wheat and other grains, fruit, and vegetables are all graded; the manufactured products of the farm, such as meat, eggs, butter, cheese, etc., are all graded, and extra prices given for the best quality; but not so milk. The farmer who knows the importance of cleanliness in all operations connected with the production of milk obtains no extra price for his good product, and he argues that it is no use expending time, trouble and money in securing a sanitary milk.

Another factor, which, however, cannot be discussed at any length here, but which none the less is a factor of extreme importance, is the relatively small price that the farmer obtains for milk. Compared with the price of other foodstuffs, the rise in the price of milk has been slow; but there are many reasons for increase of cost, such as increased length of transportation, due to the size of cities and the pushing farther away of dairy farms; the increase of middlemen, with their expensive buildings and equipment; and the wasteful system of distribution whereby many dealers cover the same ground to perform the same service.

From the farmers' standpoint, the increased cost of labour and cattle feeds has not had its corresponding increase in the price of milk; the former has increased 50 per cent. in the last twenty years, and the latter not more than 40 per cent. In the decade ending 1899, hay was worth $7.62 a ton; to-day it is worth $12.00-$15.00, and so on with the other foodstuffs. These two items, labour and cattle feeds, represent 80 to 85 per cent. of the total farm cost of milk production.

The Animal Husbandry Department of Macdonald College, after a careful analysis of the cost of milk production of a large herd supplying milk to the College, allowing for cost of upkeep, etc., and taking into account the value of an annual calf per cow, has concluded that a price of twenty cents a gallon for milk will only pay when the milk production per cow is 8,000 lbs. per head per annum. Hence, as the average farm cow of Quebec gives only about four to five thousand pounds of milk per year, the "average" farmer is actually losing money when he sells milk to the dealer for $2.00 a hundred pounds.

The consumer is buying the milk at a low price compared with other foods, and if he desires a clean, sanitary milk he must expect to pay more for the additional labour which such production entails. Milk should be sold by quality, and cleanliness must be made remunerative.

THE OUTLOOK OF THE DAIRY FARMER IN EASTERN CANADA

By W. F. Stephen, Huntingdon, Que.

(An address delivered at the Winter Fair, Guelph, Ontario.)

IT is the work of a prophet to predict the future. We are all more or less visionary at times, but our vision is not always realized. Sometimes it is of the "will-o-the-wisp" style, just when we think we have it, it vanishes. Of such a nature have been many of "our-get-rich-quick" visions of the past few years. Many individuals in following up their vision, have been led into the great dismal swamp of unprofitable speculation and are held fast in the mire of disappointment and failure.

The shrewd dairy farmer, I am happy to say, is not of this class. His vision is realized and he stands on the solid ground of safe and profitable investment. True, his profits have not been large, but he has realized from his labors more than a comfortable living for himself and his family. My statement can be verified by a drive through any dairy section, for in no locality will you find better and more up-to-date farm steadings, which bespeak prosperous conditions.

The dairy situation is becoming more complex, no matter whether the product be butter or cheese, milk or cream. The dairyman is no longer a law unto himself. He is surrounded by regulations and exactions, imposed on him by municipal, city or provincial legislative bodies. These restrictive measures give him serious consideration and cause an increased expenditure. This more particularly applies to the production of market milk and cream.

(To be continued)

POULTRY

MORE WINTER EGGS

By M. A. Jull, Manager and Lecturer, Poultry Department, Macdonald College, Que.

THE more salient features of the egg crop of Canada are first the annual increase in the production of eggs, secondly the increased consumption per capita, and thirdly the annual rise in price per dozen. It is difficult to analyze the egg situation in detail but with the available data at hand we are led to believe that more eggs of better quality are being produced from year to year and as a consequence eggs as an article of diet are appreciated more and more. The Canadian appetite for strictly fresh eggs in growing and in compliance with this demand production is rapidly increasing.

The more important causes making for increased production have been an awakened interest in poultry culture throughout the country. A more extensive farm poultry industry, the development of specialized poultry plants in many sections, and improved methods of management resulting in larger yields from the flocks.

The usual advance in the price of eggs, particularly fresh eggs, during the fall of the year, *is due largely to natural causes.* The moulting of the yearling stock shuts out this source of production leaving pullets practially as the only source of fresh eggs at this time. Pullets, particularly of the heavier breeds, do not generally commence laying before they are fully matured, and if, for any reason, the majority of the pullets have been late-hatched or have not been cared for properly during the growing season a scarcity of fresh eggs is bound to result.

The greatest hope of increasing the fresh egg supply in the fall lies in the proper handling of the pullets during the growing season. A larger fall and winter production will establish a more stable egg market which will be of benefit to the producer as well as to the consumer. More uniform production means larger profits to the producer and a more stable market for the consumer.

Storage eggs sell at relatively high or relatively low prices solely in accordance with the quantity on hand in relation to the general conception of owners as to the prospective deficiency in fresh eggs, and at the rate at which the stock is being depleted. Extremely high fall and early winter prices for storage eggs are not only brought about by the scarcity of fresh eggs laid in the fall and winter but also to the excessive waste of eggs laid in summer due to excessive heat, which naturally lessens the amount of early summer storage.

A larger fall and winter production with less summer waste will do more to equalize the egg trade than the boycotts of the Housewives' Leagues and other organizations. A high normal price is not a proof of manipulation of the market.

FACTORS INVOLVED IN WINTER EGG PRODUCTION

The more important factors upon which winter egg production depends are the stock, the environment of the stock, breeding and feeding. Farmers are gradually beginning to realize the superior earning value of pure breeds as compared with mongrels. The breeds best adapted for winter egg production in Quebec will depend upon the market requirements and particularly upon climatic conditions. Egg production is the most profitable branch in which one can engage and for all practical purpose the breeds that belong to the general purpose type will be found most profitable.

More important than breed, however, is the strain of fowl. There are good and bad strains in every variety and care should be taken to see that the best possible egg laying strain is secured. The profitable laying age of the average hen is two years and consequently our farmers should make a practice of killing off their two year old stock every year. Along with this every consideration should be given to the proper development of the pullets during the growing season. This is most important in regard to winter egg production.

In regard to the environment of the stock the poultry houses should be economical and sanitary. The management of the flock should provide for plenty of exercise and should tend to keep up the vitality and health of the laying hen. Success is largely dependent upon competent management. The health and vigor of the flock depend to a large extent upon their breeding. Many of our farmers have given no consideration at all to the breeding of their poultry and while it is not argued that a systematic line of breeding work should be carried on by the average farmer, still if he can be induced to observe his fowls more closely and to breed along a consistent line, then greater success will be assured.

For all practical purposes the requirements of the laying ration are variety, palatibility, succulence, bulk and economy. We shall not enter into a discussion as to the various purposes which the poultry foods serve.

Producing a large number of eggs is a heavy strain upon the average bird. The production of eggs calls for a variety of constituents and for this purpose a variety of poultry foods is essential.

For whole grains wheat, corn and oats usually supply the demand. Local prices will largely determine whether wheat or corn may be used economically. In regard to mashes doubtless the feeding of wet mash will induce heavier egg production than dry mash feeding. Wet mash feeding, however, requires more skill and more labor and on large poultry plants probably the dry mash method is the more economical. In feeding wet mashes on the farm care should be taken not to overfeed. Skim milk, green bone and beef scraps make up the supply of animal food. Wherever skim milk is available it should be used for the poultry as it is of more value for poultry feeding than for feeding any other class of stock. It is better fed sour than sweet and should be given regularly. Green bone has an excellent feeding value and if fed properly is more economical than beef scraps. Just at present we are paying 4 cts. a pound for beef scraps and 4 cts. for green bone and I believe that green bone is worth about twice as much as the beef scraps in producing winter eggs. If you are feeding beef scraps be sure that you get good quality. Do not feed over half an ounce per bird per day of the green bone. Where sour skim milk is available the amount of green bone or beef scraps may be reduced considerably. Mangels, cabbages, alfalfa or clover hay and sprouted oats are the chief sources of green food. Sprouted oats are one of the best forms in which to supply the hens with green food during the winter months. Material for the egg shell is supplied from oyster shell, or air-slaked lime. Grit is necessary and should be kept before the birds all the time. Also in the production of eggs of quality clean fresh water is absolutely necessary. At all times the farmer's chief aim should be to produce eggs of superior quality. Under ordinary conditions new laid eggs are probably as uniform in quality as most food products. The chief difficulty in regard to the whole egg trade is to get the eggs to the consumers in good condition. That is the problem before the producers of to-day. The egg is at its best when just laid. The longer it is kept the more it deteriorates.

In winter egg production exercise is of vital importance. The hens should be kept scratching practically all the time. Feed a variety of wholesome feed, feed it liberally, feed it regularly and at all times feed exercise into the hens.

The prifits as well as the losses depend upon the number of eggs secured in the winter months of the year. There is no reason why the winter egg production of Quebec should not be materially increased. Conditions are favorable for good winter egg production and the farmers and poultrymen of the Province should avail themselves of the high winter egg prices.

THE FARMER AND THE POULTRY INDUSTRY

By M. A. Jull, Poultry Department, Macdonald College, Quebec

POULTRY shows and breeders of pure bred fowls have done a great deal to improve the stock of the country and to encourage the keeping of better fowls. At the same time we must never overlook the fact that the commercial side is the backbone of our industry. Eggs and poultry flesh are of greater importance than feathers and fine form. The breeding of pure bred fowls has its place in the industry and every effort should be made to improve the standard of our poultry. The breeders of standard bred poultry should be interested in the commercial side of the business and the utility men should also endeavor to breed as closely to the standard as possible....

I have intimated that there is a great future for the poultry industry in Quebec. It is true that the poultry industry is improving but that development is far too slow. We should be exporting eggs and dressed poultry rather than importing them as we are now doing. In 1913 Quebec produced approximately eight million dollars' worth of poultry products and in the same year she imported approximately eight million dollars' worth. We must make the hen lay two eggs where she only laid one before. The farmer is in the best position of all to make money out of chickens, and yet we find our farmers throughout the Province doing but little in regard to supplying the increasing demand. We have recently established a poultry motto which is "100 Hens and 100 Eggs". Our object is to establish on the average farm a flock of at least 100 hens with an average egg production of at least 100 eggs per bird annually. If we can accomplish this we shall increase the value of our poultry crop by nearly 200%. It is nothing short of a shame that we are not producing enough eggs for our own people.

The principal trouble with the poultry industry in this Province, as far as I can see it, is a lack of application of the importance of the industry and of the value of a farm flock. Then again there is a considerable lack of interest in pure bred poultry breeding. There is considerable prevalence of disease in some sections owing to lack of sanitary conditions and lastly we have to admit that lack of proper care in marketing our products is causing us an enormous waste annually. This is one of the important features of the whole industry. We have been advocating increased production and we have been dicussing methods of production for a number of years, but as yet we have done little to improve the methods of marketing and which means so much in increasing the profits to the producers. By way of remedying these undesirable conditions I would like to suggest an educational campaign. The farmers need to become interested in this important industry. In many cases the average farmer knows *why* but he does not know *how*, and if we can do anything to instruct him he will become interested and will do much to improve conditions. In the next place

WOMAN'S WORLD

NEW BOOK

FOOD PRODUCTS, by Henry C. Sherman, Professor of Food Chemistry, Columbia University, (New York: The Macmillan Company, Toronto: The Macmillan Company of Canada. 594 pp. $2.25).

In this book Professor Sherman has presented in well-digested form the gist of our present knowledge on the composition and nutritive value of the foods used in North America, together with much information regarding food legislation as adopted in the United States. The dairy farmer will find much to interest him in the chapters on milk and its products (80 pages), the poultryman in the chapter on eggs (30 pages) and in the five pages devoted to poultry, the gardener in the chapter on vegetables, fruits and nuts (60 pages), and the housewife everywhere. This is a book which we can heartily recommend for the rural library and especially for those of Homemakers' Clubs.

J. F. S.

FOODS AND FOOD PREPARATION

Lesson XII

PROTEIN OR NITROGENOUS FOODS.—MILK

Composition

THE value of milk as a food is perhaps not generally understood. Many people think of it, for adults at least, as a beverage rather than the nourishing food which it really is. The average composition of cow's milk is as follows:

Water	87 %
Casein	2.88%
Albumin	.51%
Fat	3.68%
Sugar	4.94%
Mineral Matter	.72%

It is seen from the table that all the classes of foods are represented in the solids of the milk. The fat and sugar serve as fuel, the proteins to make and repair the tissues of the body, and the mineral matter is valuable for the making of bones and teeth.

A glass of milk adds as much to the food value of a meal as a quarter of a loaf of bread or a good slice of beef. For this reason it is often economical to serve milk in place of other foods, but extravagant to add it to a meal already sufficient in nourishment.

Digestibility

While milk is taken as a liquid it should really be looked upon as a solid food, for in the stomach it is coagulated by the action of the rennin in the gastric juice. If the milk is swallowed quickly, a large curd may form which will remain long in the stomach. If the milk is sipped slowly, the curds will be small and therefore more readily acted upon by the gastric juice. The fat of milk being in an emulsified form is more easily digested than the fat of meats.

Care of milk

Impure milk is most dangerous. Tuberculosis, typhoid, scarlet fever and diphteria may be contracted from it. Milking should be done in a *clean building* and the milk cooled as quickly as possible to prevent the germs that do get into it from multiplying. It should be kept in a *cool, clean* place, *closely covered.* Milk vessels should be washed in lukewarm water and thoroughly scalded. People suffering with infectious diseases should not be allowed to handle these vessels.

RECIPES

Junket

1 pt. fresh lukewarm milk.
1 junket tablet.
½ teasp. vanilla.
2 tblsp. sugar.
A little salt.

Reduce tablet to a powder and mix with 1 teasp. lukewarm water. Stir sugar and salt into milk and heat by stirring over hot water until lukewarm (98°F.) Add vanilla and tablet. Pour into a serving dish and stand in a warm place until junket has set. Chill and serve. Do not jar the dish while the junket is setting.

Caramel Junket

Instead of the sugar, add to the milk 3 or 4 tblsps. of caramel.

MILK AND EGGS

Custards are a combination of milk and eggs. If overcooked or cooked in too high a heat, the milk will separate and the custard will curdle. If the following rules are carefully followed, the best results will be obtained.

Proportions for Custards

1 egg to 1 cup milk. A very loose custard.
1 egg to ¾ cup milk. A dish custard.
1 egg to 2-3 cup milk. Large mould consistency
1 egg to ½ cup milk. Small mould consistency.

Method

Beat the eggs *slightly.* And the other ingredients and stir in milk. Strain into a buttered mould. Place mould in a pan of hot water and bake in a *very moderate* oven until when tested the blade of a knife comes out clean.

Caramel Custard

1 egg.
2-3 cup milk.
2 tblsp. caramel.
Pinch of salt.
Few drops vanilla.

Rice Custard

2 cups milk.
2-3 cups rice (cooked).
2 eggs.
½ cup sugar.
½ teasp. salt.

Raisins, sliced fruit, etc., may be added if desired.

Mix as a custard and add other ingredients.

Bread custard

2 cups milk.

I would like to see more interest taken in local and state poultry shows. I am sure that before very long our shows will be much larger and more numerous than thy are now and this will be a good thing. I hope, however, that our breeders of pure bred poultry will avoid extremes in the matter of breeding. Again I hope that too much attention will not be given to a lot of the new-fangled breeds which are being introduced from year to year. We have enough breeds now and our principal object should be to improve them as far as possible. I hope that our breeders will keep an eye on the egg basket, as egg production is the most important line of poultry work.

I would like to see our show managers give a little more attention to the utility end of our shows. Along this line I would suggest graded classifications for the prize lists. Give prizes for utility pens and give prizes for dressed poultry and eggs. These utility exhibits will do more than anything else to get the farmers interested in the poultry industry. By a graded classification I mean giving larger prizes for the larger entries. Suppose you decide on three prizes of the regular prize list say, $1.00 for the 1st., 75 cts for the 2nd., and 50 cts. for the 3rd. Then were there are five entries or more increase the 1st. prize to $1.25, 2nd. $1.00, 3rd. $0.75 give a fourth prize of $0.50, and then where there are ten entries or more in any one class, increase the 1st. prize to $1.50, 2nd. $1.25, and so on down to ribbons for the 7th. and 8th. prizes. This will encourage the breeding of the popular commercial breeds and it is only fair and square that a bird winning 1st. prize in strong competition will be apt to be a better bird than one winning 1st. prize where it competes against one or two other birds. Give larger prizes where there is stronger competition and we will find more interest taken in the better classes of poultry.

If more attention is given to sanitation of the poultry plant I am sure your returns will be much larger. In many parts of the country the farmers are raising lice on a large scale. These little pests are easier to raise than are chickens and unless they are kept in check they will do much damage. Thorough disinfection, particularly in summer time, is absolutely necessary. Make a weekly application to the roosting quarters and other fixtures in the house of a good commercial disinfectant. Whitewash the house at least once a year. It is advisable to add a 5% solution of carbolic acid to the whitewash. This will serve as a disinfectant. By all means keep the poultry yards and roosts sweet and clean. Give the fowls free range and avoid soil contamination. The health of the flock has a great deal to do with egg production.

Next. I wish to refer to the great losses sustained in the marketing of dressed poultry and eggs. The loss in marketing dressed poultry is due largely to improper methods in killing and plucking. If the general purpose breeds are being kept then by all means the farmers should take every care in fattening and dressing the birds for the market. The loss from the dressed poultry trade, however, is not nearly as great as the losses in the egg trade. At the annual meeting of the National Poultry, Butter and Egg Association held in Chicago last fall a statement was made by a prominent egg dealer that the United States lost annually more eggs than were produced in Canada. Since this is the case you must realize what an enormous waste in going on annually and Quebec is doing her fair share in squandering money through improper methods of marketing eggs. The principal losses are due to heated and partially hatched eggs. This is largely caused by the keeping of the male birds in the laying flock throughout the summer months. Under no conditions should the male birds be allowed to run with the hens except during the breeding season. A fertile egg will not keep in good condition nearly as long as an infertile egg. There are also placed on the market a large quantity of shrunken, stale and rotten eggs. Whether the farmers sell them or not we know that there are many rotten eggs on the market. The albumen of the egg is an excellent culture medium for the growth of bacteria and if the eggs are not marketed in a clean and fresh condition they cannot be expected to remain good very long. It is a wise precaution not to wash eggs at all, as washing tends to open up the pores and allows the action of bacteria to be carried on much more rapidly. The system of marketing eggs must be changed before much improvement can be expected. We must stop selling so many partially hatched, shrunken, stale and rotten eggs, and when we do stop our prices will increase.

It may be possible that within a few years we shall be selling eggs by weight. This would remedy many of the undesirable conditions of to-day. It would be very difficult, however, to establish a complete system where all the eggs were sold by weight. I understand, however, that it is done to a considerable extent in Denmark and with the introduction of this system in this country those fowls which are producing standard-sized eggs of 24 oz. to the dozen would be more profitable in comparison with those birds which lay small eggs.

2 eggs.
½ cup sugar.
¼ teasp. salt.
2-3 cup cubed stale bread.

Prepare the bread and arrange it in a buttered baking dish. Pour over it the custard mixture, and allow it to stand about ten minutes before putting it in the oven. Bake as plain custard.

If a meringue is to be used, reserve one egg white and make it into a meringue. When custard is baked, spread jam over the top, cover with meringue and place in the oven until meringue is set and delicately brown.

Custard sauce

1 cup milk.
1 egg or 2 egg yolks.
1 tblsp. sugar.
½ teasp. vanilla.

Scald milk in double boiler. Beat the eggs *slightly*. Add the sugar. Stir a little of the heated milk slowly into the egg mixture. Stir this into the remainder of milk in the boiler and stir constantly until a coating forms on the spoon. Strain *at once* into a cold bowl and add vanilla.

If a thicker sauce is required, use only two-thirds cup milk. Whipped cream may be folded into this when cold.

F. CAMPBELL,

Demonstrator for Homemakers' Club

FOODS AND FOOD PREPARATION

Corrections to Lesson XI

(December issue, p. 131)

SEVERAL printer's errors have unfortunately escaped correction in Lesson XI. In the first place, the second class of protein substances is omitted. It should follow the line "Vitellin.... egg yolk", and should read:—

"2. Albuminoids—those which alone cannot build or repair because they lack certain substances which make up true proteins. E.G. Gelatin."

The following addition should be made to the paragraph on p. 132 headed "Preservation.":—"A convenient and entirely satisfactory substitute for water glass in the preservation of eggs is slaked lime. Slake 1 or 2 pounds of quicklime with hot water. Place in a four-gallon butter crock, add two gallons boiled, cooled water and stir thoroughly. Pour off enough of the liquid into another vessel to allow the first layer of eggs to be packed and restore the liquid to the crock as the other layers are placed. The eggs must be completely covered and the undissolved lime must not be removed. Keep the crock covered and in a cool place."

In the recipe "General Method of making an Omelet", page 132, second column, the second sentence from the end should read "Crease and fold omelet, etc.", instead of "Grease and fold omelet."

QUEBEC HOMEMAKERS' CLUB IN RICHMOND COUNTY

ON Tuesday, December 8th., Miss Campbell of Macdonald College addressed a well attended meeting of the ladies of Danville, which had been arranged by Mr. Durling, College Demonstrator for the County. Although the ladies were very busy with patriotic work, a Club was formed, owing largely to the interest manifested by the large number of girls present at the meeting. With so many young and enthusiastic members, wisely led by the Senior Homemakers, who so kindly joined in order to help the girls along, the Danville Club, the first in the country, is bound to be a success.

The following officers were appointed:—

President, Mrs. G. H. Murray.
Vice-President, Miss Mary Boyd.
Secretary-Treasurer, Miss Velme Scott.

HOMEMAKERS' CLUBS IN STANSTEAD COUNTY

DURING the last part of November and the early part of December a series of meetings was planned by Mr. A. F. Emberley, Macdonald College Demonstrator for Stanstead, for the purpose of introducing the Household Science Extension work into that county. Miss Campbell, Demonstrator for the Homemakers' Clubs, addressed meetings at Ayer's Cliff, Smith's Mills, Way's Mills, Coaticook, Magog, Hatley, North Hatley and Stanstead. The meetings had been well advertised and the average attendance was good. Clubs with the following officers were formed:—

Ayer's Cliff	
President,	Miss Una Webster.
Vice-President,	Mrs. Charles Libby.
Secretary-Treasurer,	Mrs. Will Hurd.
Smith's Mills	
President,	Miss Ruth Knight.
Vice-President,	Mrs. Asa Miller.
Secretary-Treasurer,	Miss Etta Byers.
Way's Mills	
President,	Mrs. W. H. Holmes.
Vice-President,	Mrs. F. Wilkinson.
Secretary-Treasurer,	Mrs. W. B. Sargent.
Magog	
President,	Mrs. A. Armstrong.
Vice-President,	Miss M. E. Bayley.
Secretary-Treasurer,	Mrs. Earle Martin.
North Hatley	
President,	Mrs. E. B. Husband.
Vice-President,	Mrs. A. H. Ham.
Secretary-Treasurer,	Mrs. J. R. MacKay.
Stanstead	
President,	Mrs. H. P. Stockwell.
Vice-President,	Mrs. G. A. Channell.
Secretary-Treasurer,	Miss Sybil Hackett.

On the day of the meeting at Coaticook, the ladies were very busy with the Patriotic Bazaar and only a few of them could attend. Those present, however, were much interested and invited Miss Campbell to return at some more opportune season. At Hatley a Committee was formed to consider the advisability of forming a Club after the New Year.

Miss Campbell wishes to thank the people of the county for their hospitality and the many kindnesses she received while there.

THE CHILDREN'S HOMER

Part II

The Adventures of Odysseus.—II

TELEMACHOS had a prosperous voyage to Pylos, and was kindly received by the aged Nestor and his sons. But they could not tell him anything of his father, and advised him to go to Menelaos in Sparta. So Telemachos went on to Sparta.

There Menelaos and Helen greeted the young stranger hospitably, and Helen recognized him almost at once. She had seen him long ago, before ever she had gone to Troy, and then, she said, he looked so like his father.

Telemachos told them the reason of his journey, how much Odysseus was needed in Ithaca, and how, unable longer to bear the insolence of the suitors, he had set out to seek his father.

Menelaos shook his head sadly when he heard Telemachos, and began at once to tell him all he could of the fate which had befallen Odysseus. All that he knew he had learned through his strange adventure with Proteus, the old man of the sea.

Menelaos said that from Troy he had sailed to Egypt; thence to Pharos, an island near Egypt, where ships were wont to stop for water. But contrary winds had held him in this island longer than seemed natural. Finally one day when he was walking by the shore alone, a sea-nymph, a daughter of Proteus, had taken pity on his sadness, and promised to help him.

She had said that Menelaos must come with several chosen comrades to a certain cave, and she would hide them near where her father slept. Then they must seize the old man and hold him firmly, no matter what strange shapes he might take. In the end, she had said, Proteus would tell him why he was delayed in Pharos.

Menelaos told how he had done her bidding, and she had covered him and his comrades with the skins of sea-cows, so that when old Proteus had driven his cows into the cave and counted them, he had counted Menelaos and the others with them. They would have died of the odor of the sea-cows, if the nymph had not rubbed ambrosia, the perfume of the gods, on their nostrils to protect them.

When Proteus had fallen asleep, they had seized him. He had changed at once into a lion, but, terrified as they had been, they had held on. Then he had beome a boar, a panther, even water, that seemed to slip through their hands, and at last a tree, but they had never once let go the least little bit, and at length Proteus had returned to his own shape, and answered the questions of Menelaos.

He had told him he must go back to Egypt and offer sacrifices to the gods, which he had forgotten before, and after he had done that he had sailed safe home.

Menelaos told Telemachos, too, how he had asked Proteus about his brother Agamemnon, and the other kings of Greece. And Proteus had related how Ajax had been ship-wrecked and drowned; how Agamemnon, finally reaching Mycenae, had been killed by his treacherous wife, Clytemnestra. And last of all, Proteus had said that Odysseus, whom Menelaos loved next to his brother, was indeed still living, but was held captive on the island of Ogygia by the nymph Calypso.

So Telemachos learned at least that his father was still alive.

Meanwhile, back in Ithaca, when the suitors learned that Telemachos had actually gone, they plotted to meet his ship on its return, and slay him. One of the faithful heralds of the house overheard them talking, and told Penelope about it. Penelope's terror at this, besides all the trouble she already had, would have been too hard to bear. Athena, pitying her, sent a dream to comfort her sad heart, and promised her to guard Telemachos.

MARGARET GRAY

WAYS OF CLEANING KITCHEN IRON WARE

THERE is usually more or less iron about a kitchen, and this iron must be more or less frequently cleaned.

If it has not been exposed to dampness and is not rusty washing with hot soapsuds or weak sal soda water and rubbing dry with a cloth is all that will be required.

Iron sinks that are rusty may be cleaned by rubbing the inside with mutton fat, free from salt, and sprinkling with powdered quicklime. Leave over night and in the morning wash with plenty of water and a brush. Rinse thoroughly with a sal soda solution and then with clear hot water.

Rust may also be removed by scouring with powdered emery, cut with benzine.

OF GENERAL INTEREST

PROTECTING OUR FEATHERED FRIENDS

Increase of Destruction by Insects due to Decrease of Insectivorous Birds in Canada

IN any discussion on the protection of bird life in Canada, considerable opposition has always been manifested by the agricultural interests. It is claimed that birds are responsible for great damage to maturing fruits, berries, tomatoes, etc., and, earlier in the season, to the seed planted in the ground. This is true to a certain extent. But, as in the study of any subject, there are two sides to the bird protection question. The damage to the fruit is visible to the eye of the grower, and he consequently waxes wroth.

The other side of the subject is one with which the agriculturist is less familiar. Could the birds place their daily food before those hostile to them, it would readily be seen to what extent they serve the interests of those who are dependent upon the products of the soil.

An analysis of the contents of the stomach of thousands of birds has shown that 90 per cent. of the food consisted of insects and 10 per cent. of vegetable matter. Upwards of 5,000 insects have been found in the stomach of one bird. It has been estimated that the destruction by insects in Canada amounts to approximately fifty million dollars annually. Last year the tent caterpillar was very prevalent: this year the army worm has made its appearance and is causing great loss to the farmers in certain sections. It is known that with the decrease in the number of birds which annually reach Canada in the spring, there has been a constant increase in the destruction by insects. It has also been stated that, if all bird life were destroyed, seven years would see the end of vegetation in Canada. This has been the reason for an active campaign for the protection of birds. The United States Congress has passed an act for the protection of migratory birds, and interested parties are bringing the matter before the attention of the Canadian Government.

Apart altogether from the practical view of bird life, there is the sentimental side. What would Canada be like without our feathered friends? If we could no longer look forward to the arrival of the first spring robin, or of the wren or the wild canary, something would be missing from our lives which we could not replace.

This is a subject which should engage the attention of school boards and teachers. The pupils should be taught to protect our feathered friends and their nests. The Boy Scout movement has taken up the protection of bird life and in their hands good work is being done.

Conservation

PUT MORE BRAINS INTO FARMING

THE best of farmers realize very keenly the supreme importance of wise and efficient farm management. It means so much to the final outcome. The man who is a student of his farm very soon gains the conviction that the subject is bigger than he is; that he needs all the help, both physical and mental, that he can employ to make things come out right. And then, with the best of forecast, he is subject to the hazard of the weather which often sets him back and thwarts him in his wisest and best endeavors. As one farmer once remarked to us who had formerly been a railroad engineer and a good one too: "I used to think that railroading could beat any vocation in compelling a man to keep his wits on their feet all the time; but farming, if you do it right, can beat the railroad twice over".

Some men get discouraged in trying to do as well as they know. There are so many hindrances in the way. But there is this to be said of the farm: It is a place for the best trained brain, the wisest foresight and the largest use of what science has to give if we but know it, and there is no place that calls for better business management than the farm. Farmers as a rule do not appreciate the possibilities of their own farms. Farming has not been considered a learned profession. From father to son for many generations it has not been thought necessary to be well educated in farming. It is for that reason that you see so few young men developing their minds and making an intellectual study of this pursuit.

But conditions are changing. The expense of living is increasing, the soil is growing less and less productive in the hands of nine out of ten farmers. The allurements of town life and the hope of winning a big fortune are taking away the best intellectual product of the farm. The mistaken notion that a man can never win distinction in society by being a farmer misleads a host of young men who are raised on the farm. And then there is the strange unreasonable idea that thousands of farmers have that there is no need of giving their sons special education for farming. They are willing to spend their hard earnings to send a boy through college to make, very likely, only a third-rate lawyer or doctor of him. Such farmers lack a true appreciation of the possibilities of first-class farming to start with. Both they and their boys see only the work side of farming. They do not see that there is a still more strenuous work side to every other pursuit if a man wins its best rewards.

Outside of farming the Lord does but mighty little to help any man along in his vocation.On the farm he does so much as to deaden the desire for knowledge, enterprise, brain power, individual pride, and love of conquest. But the light of a truer conception of what real farming means to the farmer himself, to his mind as well as his hands, is dawning on the world. If special education and training is worth anything anywhere it is worth it on the farm. Because so many farmers do not see this great truth, farming is what it is, soil impoverishment is what it is, and the state of individual mentality on the farm and the low profit of farming is what it is.

Hoard's Dairyman

TWO STATISTICAL YEAR BOOKS

TWO official statistical Year Books have recently been issued, viz., the Canada Year Book, 1913, published by the Census and Statistics Office and the Statistical Year Book of Quebec, published by the new Bureau of Statistics of the province of Quebec.

Of these two works the first named, published annually since 1886, was rearranged by the late Dr. Blue, and the volumes from 1905 to 1911 constituted the second series. In 1912, after the transfer of the Census and Statistics Office from the Department of Agriculture to the Department of Trade and Commerce, the work was again reorganized, and the present issue for 1913 represents the efforts of two years in bringing the book up to date and rendering it more generally useful and comprehensive as a work of reference. Permanently bound in a suitably designed cover, instead of as formerly in paper covers, it includes as new features a large scale map of Canada, a statistical summary, giving in three pages a bird's eye view of Canadian progress since Confederation, coloured statistical diagrams and charts and letterpress describing salient features, explaining doubtful points and making clearer the significance of the figures.

Illustrated articles by competent authorities on the history and physical characteristics of Canada are special features of the edition of 1913, which altogether comprises 351 tables within the compass of twelve sections and 672 pages.

The Statistical Year Book of Quebec(first year), recently printed, bears date in its letter of transmittal of May 30, 1914. It is issued by the Quebec Bureau of Statistics, which was created November 11, 1913, under an act of the Legislative Assembly assented to December 21, 1912. It consists of 463 large octavo pages. The work is divided into seven principal parts including (1) a chronological summary of events connected with the history of the province; (2) a description of the province; (3) climatology; (4) area and population; (5) production; (6) revenue and expenditure and (7) government and administration. For many of the subjects dealt with the book is necessarily dependent upon publications of the Dominion Government, as for instance in the case of climate, area, population, agriculture, manufactures, labour, etc.; but for other subjects, such as education, philanthropical institutions, forestry, inland fisheries, constitution, government, etc., the statistics are mainly provincial, and the information given could only otherwise be gathered from scattered sources. The work contains maps and diagrams, including a large map of old, or what is now southern, Quebec on the scale of 20 miles to the inch. Entirely French in conception and treatment, we would expect this Year Book to be as it is—thorough, complete and scientific, because it is brought out by an officer trained under and nominated by M. Lucien March, Chief of the French General Statistical Service at Paris. This however does not detract from the personal credit due to M. Henri Bunle the officer referred to. Altogether we cordially welcome this new contribution to Canadian statistical literature, and hope that before long other provinces of the Dominion may proceed in a similar direction.

Census Monthly

DESTRUCTION OF RATS

Systematic Methods Necessary to Secure Permanent Results

THERE are various estimates regarding the annual loss of property caused by rats in Canada. In the United States the loss is estimated to be as much as $300,000,000. Of grain alone, they are estimated to have destroyed $100,000,000 worth, or enough to feed a laying hen for one year for every man, woman and child in the country.

Co-operation and organization in rat destruction must not be overlooked. To destroy the rats on only one farm in a community has little permanent effect, since they are soon replaced from neighbouring farms. If plenty of food is left unprotected and within reach of the rats, they are sure to multiply rapidly and become a serious pest. Care should be exercised to protect grain, roots, vegetables and other foodstuffs on the farm. Poorly-fed rats will not multiply so rapidly and are more easily trapped.

The use of concrete for floors or wherever rats burrow, will do much towards reducing the loss from these pests.

The value of dogs as ratters can hardly be overestimated. Small Irish, Scotch and fox terriers can be properly trained and are superior to other breeds. Under reasonably favourable circumstances a good terrier may be relied upon to keep farm premises free from rats.

Such natural enemies of rats as hawks, owls, and smaller predatory mammals should be given protection. Greater cleanliness about stables and farm buildings, care in construction of buildings and drains, the early threshing of grain to remove food and harborage, the removal of piles of trash from the fields, and the systematic destruction of rats are important aids in limiting their numbers and in reducing the losses from their depredations. —*F. C. N. in Conservation.*

FARM LOSSES IN MANURES

THE manure problem is a fundamental problem for the farmers of today and tomorrow. One of the most important lessons for them to learn is how to obtain good barnyard manure; and then, to care for it and use it intelligently.

In many parts of Canada, the manure is simply thrown away. In Ontario, 186 farmers out of 200 visited exercised no care to prevent waste, and in Quebec conditions are nearly as bad. In other places, notably in the west, it is burned; and, in places where the manure has accumulated, the stables have been moved away, instead of making use of the manure. This means a great annual loss. At the present price of plant food, the amount of manure produced in the United States every year is worth nearly $2,500,000,000. In 1908, the value of the whole corn crop in the United States was only $1,601,000,000. These figures show the enormous importance of manure production.

The greatest sources of loss are from allowing the liquid portion to drain off, from leaching by rain, and from heating and fermentation.

The liquid is much more valuable in plant food per pound than the solid. In cow manure the total liquid portion is about the same as the total solid portion. Yet many farmers arrange their stables to drain off the liquid. *Don't do it.* In this way from $10 to $15 worth of fertility, per cow, can be lost annually.

Where possible, the manure should be spread on the field as made. It saves handling twice, and there is a greater tonnage then than at any other time. This can be done provided the land is not so hilly as to cause the manure to be carried away by rain or melting snow. The effect of green manure will be seen for a longer time than that of rotted manure on account of the decomposition taking place in the soil. If this cannot be done, by all means have a covered shed where the manure can be stored, where it will be packed by stock tramping on it, and where it will be kept moist. If it is kept tramped and moist, and if the shed has a cement floor, there will be very little loss.

Experiments in the west have shown that a very light application of barnyard manure in the spring after sowing, as a top dressing on soils having a tendency to blow, gives excellent results, not only preventing blowing but giving increased yields from the added plant food.—F.C.N. in *Conservation.*

ROTATION OF CROPS

Larger Profits as Final Result.—Temporary Advantage only Gained by Neglect of Systematic Farming

THE report of the Commission of Conservation's Agricultural Survey for 1913 specially emphasizes the absence of a systematic rotation of crops in every province. In some of the older districts of Ontario, the rotation followed approaches more nearly to the ideal than in any other portion of the Dominion, but, even there, the area in hoe crops is not large enough nor are the rotations arranged systematically, so as to cover the whole tillable area of the farm within a reasonable length of time. In Manitoba, practically no clover and no hoe crops are grown. Although summer-fallowing is commonly practised, yet the continual cropping of wheat from the same field is of too frequent occurrence.

If a western farmer were asked why he does not vary his crops, he would probably answer that he grows wheat because it pays better and that he will continue to grow it so long as it yields him the maximum return. It may be true that wheat yields a higher net return per acre than any other crop and yet this does not justify the raising of wheat on every available field.

Other factors, besides the net return per acre, enter into the problem of the selection of crops. One must consider the effect of a crop upon soil fertility, the demands it makes upon farm labour, and the necessity of keeping fields free from weeds. It may even be profitable to grow a crop which, valued by itself and without relation to the farm operations as a whole, is produced at an apparent loss. Such a crop must be regarded as a by-product, *i.e.*, as something which is not profitable for its own sake, but which gives adequate returns when produced as a part of a larger enterprise.

For instance, by varying crops it is possible to distribute the year's work more evenly and thus to reduce the cost of labour. The saving so effected should be credited to the apparently unprofitable crop. Or again, it pays to grow a crop at a loss when it exercises a beneficial effect upon the soil, as in raising mangels for the sake of the cultivation or clover to plough under to supply nitrogen for future crops. It pays to put good wheat land into pasture for two or three years to kill weeds and to obtain the manure. The same principle applies to live-stock as well as to crops. Hogs may not pay by themselves but they may give handsome returns in conjunction with cows. The principle which the farmer must keep in mind is to so combine his various enterprises that he utilizes his land, labour and working equipment to the best advantage and thus secures the largest net return from the farm as a whole.

THE RURAL SCHOOL

BY far the larger majority of those who are rural born do not get beyond the "little red school house" in their educational career. The country school house and its surroundings form the physical basis, the earthly temple in which the child receives his education; the teacher, the scholars, and the community life make up the soul, the living element of the system.

What the country school may do for the farm boy and girl depends in greater measure on the spririt than the body. Potent as is the influence of the teacher on the pupil, it is no less true that the community life may be made to exert an abiding effect on the well being of the school.

The successful teacher, either under rural or urban conditions, is the one who succeeds in allying best the work of the school to the life of the neighborhood. Therein lies one of the great values to be found in agriculture as a subject of study, in that it serves so well to unite the school to its rural environment. The teacher who can vitalize the customary subjects of instruction, who can render the abstract conceptions of mathematics, history, and geography into the concrete form of daily experience and knowledge is able to wield an influence over the lives of her pupils that will be abiding.

When our rural schools are so taught, no one will think of comparing them with the city product that has developed a different type to meet a widely different need. — H. L. Russell, Director Wisconsin Experiment Station.

HOGS ARE PROFITABLE RAISED AS A SIDELINE

"I hate pigs. The only time I have any use for them at all is when I am fastening up the tail board of the wagon to take them to market."

"Well, I kind of find them convenient about the place to clean up with. "There are so many scraps and so much garbage to be cleaned up that I couldn't get rid of if I hadn't pigs, and then they help clean up the stubble, too."

This was the way that Professor Geo. E. Day, of Guelph, told of a conversation he once had with a prominent farmer. He used it in illustrating the fact that the hog fills a distinctive place, and is worthy of consideration on every farm.

Prof. Day was not willing to advise men to enter upon hog raising on a large scale. It is only one man in a great many who could make a success at it on a large scale, as the profits all depend on the management given to the herds. The hog shows to the very best advantage when used as a sort of by-product of the farm which might otherwise be wasted.

He did not believe that the plunger is the one who has made money out of hog-raising—the man who jumped into it when hogs were high, and then became discouraged when prices fell. Then men who have made the money are the men who have consistently stuck to the job, and who are able to take advantage of the market when it is up, and yet are not overloaded when it is low.

The hogs are open to speculation more than any other animal, on account of their rapid reproduction. The result is that the production varies largely, which has an immediate effect on the prices. However, the speaker had noted that though prices often went down, they always came up again, and low prices were one excuse for a man going out of hog raising.

Business as usual; quality better than usual, he supplied as a slogan for the industry, in closing his address.

Weekly Sun

COMFORTABLE COWS GIVE MOST MILK

"NOW is the time that the farmer should be especially careful of the treatment which be gives the cows on his farm," declares R. M. Washburn, associate in dairy husbandry at the Minnesota College of Agriculture.

"Cold winds and rains are costly. They chill the cow, just as they would a warm stove, entailing the burning of more fuel. To avoid this the farmer should provide protection early.

"The ration at this transition period between summer pasturing and winter feeding is important. Any cow that has been giving milk since last spring will decrease her flow rapidly if she is not fed liberally. The result will be a a greatly reduced profit from the dairy herd during the winter months.

"We are nearing the season when butter fat brings the highest price. Farmers will recognize the wisdom of keeping up the milk flow through this period.

"Ido not advocate the feeding of much grain at this time. What is fed should merely supplement a ration composed largely of late grasses, pumkins, soft shelled squash, roots and small potatoes.

"Many of the farmers do not believe that the small potatoes are worth picking up, not realizing that five pounds of potatoes are worth as much as one pound of grain. They may be brought in and put on the barn floor, where, if they are covered with hay to keep off the forsts and prevent light time, and will take the place of a considerable amount of expensive grain or mill feed. Frozen potatoes, however, should not be to cows. They reactt unfavorably on the digestive tract.

"Herding the cows on the young clover in the wheat and oats stubble is a good plan. They will get much of value from this young growth".

The JOURNAL of AGRICULTURE

AND HORTICULTURE

Volume 18 February 1st 1915 Number 8

PERCHERON BROOD MARES—A POPULAR BREED IN QUEBEC

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

Now is the time to get your order placed for an

IDEAL GREEN FEED SILO

(MADE IN CANADA)

WHEN spring and summer work come on you'll be busy. Now when you are not rushed with farm work is the best time to settle the silo question.

You know you ought to have a silo. You know that you can make more money from your cows and stock with a silage ration. Don't go through another winter without a silo.

Make your plans now. Think of the hay you fed last month. Most of that would have been saved if you had a silo. When you can put silage up at a cost of two to four dollars a ton why feed hay and other expensive roughage?

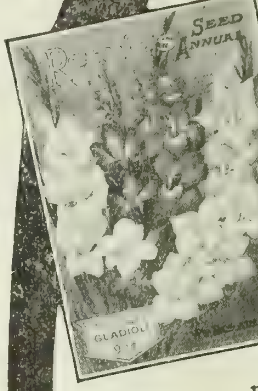
Our new silo book will soon be ready to mail. Contains a lot of valuable information about silos and silage. Write for a copy.

DE LAVAL DAIRY SUPPLY CO.. Ltd.

LARGEST MANUFACTURERS OF DAIRY SUPPLIES IN CANADA

MONTREAL PETERBORO WINNIPEG VANCOUVER

RENNIES want to send you their Seed Book-*Sent Free.*



IT describes more than 1500 of the best varieties of Vegetables, Flowers, Shrubs, Vines, Fruits and Hardy Plants suitable for all parts of Canada—scores of varieties of Asters, Pansies, Petunias, Phlox, Sweet Peas, climbing and dwarf, Roses, Dahlias, Gladiolus, Pæonies and Phlox Plants, etc., for beautifying the home grounds.

It offers many rare, new and most desirable kinds—many of them not obtainable elsewhere — at prices no greater than you are accustomed to paying for sorts everybody has.

You Will Like Our Seeds, Bulbs and Plants.

"BACK TO THE LAND."

Our Nation is at War. Never before in the history of our country has there been a more urgent call to till the soil than NOW. The seriousness of the European situation demands prompt action by the Gardeners and Farmers throughout Canada to grow an abundance of Foodstuffs, Vegetables, Roots and Fodder—and make ample provision for the supplies that will be required. We have large stocks of fresh, pure, honestly tested Seeds, Bulbs and Plants, and we are maintaining low prices — within the reach of all.

LET US SEND YOU OUR NEW BOOK FREE.

Write a post card to-day to our nearest address.

WM. RENNIE CO., Limited
190 McGill Street - MONTREAL
394 Portage Ave. WINNIPEG
Adelaide and Jarvis Sts. TORONTO
1138 Homer St. VANCOUVER

EASY Churning—

—churning that is more of a pastime than a labor. That's the kind of churning a MAXWELL'S "FAVORITE" does. The mechanism is so perfect—so smooth. And it gives splendid results.

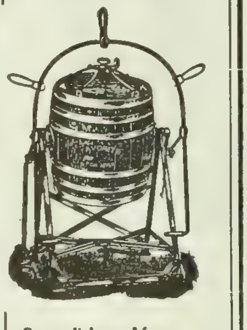
THE *Maxwell* "FAVORITE" CHURN WITH BOW LEVER

is used in thousands of dairies—in Canada—Australia, New Zealand, S. Africa and Denmark. It produces butter with a minimum of effort. Used in Agricultural Colleges. Praised by Government Inspectors as the finest butter maker in the world.

Get your dealer to demonstrate the unique features of the MAXWELL "FAVORITE" (with Bow Lever)

MAXWELL LIMITED, - St. Mary's, Ontario.

Adjustable handle—moveable to centre, right or left, as desired.



Strong light steel frame.

All roller bearings.(not ball)

Dark oak finish with gold bronze hoops.

Sold in eight sizes.

2

Highest Type Spraying Machine in the World!

Pretty big claim that, but fully justified by the facts. At the Canadian Government Spraying Contest, Grimsby, Ont., the SPRAMOTOR took first prize with ease from eleven competitors. That puts SPRAMOTORS in the lead among all makes.

The outfit illustrated here is our gasoline-power model, the best machine we make, therefore "the highest type spraying machine in the world". We make SPRAMOTORS in many styles and sizes, for the largest farm and for the smallest, at prices from $6 up to $350—every one the best outfit for the money. We are sole makers of the

Spramotor
It isn't a SPRAMOTOR unless we made it

and have been making nothing else for the past twenty years. Over 20 patents covering features you can get in no other machine but the SPRAMOTOR. We have won over 100 Gold Medals and First Awards in all parts of the world. The next best machine isn't good enough for you.

FREE Write us a short letter, giving some idea of your spraying needs, and we will send you free, a copy of our valuable illustrated work on Crop Diseases, also full details of a SPRAMOTOR that will best fill your requirements.

Made in Canada—No duty to pay.

HEARD SPRAMOTOR LTD., 180 King St., LONDON, CANADA.

WISCONSIN INCUBATOR AND BROODER BOTH FOR $13 90

130 Egg INCUBATOR
130 Chick Brooder
BOTH FOR
$13 90 Freight and Duty PAID

If ordered together we send both machines for only $13.90 and we pay all freight and duty charges to any R. R. station in Canada. We have branch warehouses in Winnipeg, Man. and Toronto, Ont. Orders shipped from nearest warehouse to your R. R. station. Hot water, double walls, dead air space between, double glass doors, copper tanks and boilers, self-regulating. Nursery under egg tray. Especially adapted to Canadian climate. Incubator and Brooder shipped complete with thermometers, lamps, egg testers —ready to use when you get them. Ten year guarantee—30 days trial. Incubators finished in natural colors showing the high grade California Redwood lumber used—not painted to cover inferior material. If you will compare our machines with others, we feel sure of your order. Don't buy until you do this—you'll save money—it pays to investigate before you buy. Remember our price of $13.90 is for both Incubator and Brooder and covers freight and duty charges. Send for FREE catalog today, or send in your order and save time.

FREIGHT and DUTY PAID

Write Us Today--Don't Delay

WISCONSIN INCUBATOR CO. Box 188 , RACINE, WISCONSIN, U. S. A.

VETERINARY DRUG STORE

The best and purest veterinary drugs at special low prices.

Consultation by letter, free of charge, with the Company's VETERINARIAN, for any diseases, write and consult now. TAKE ADVANTAGE OF THIS OFFER TO KNOW THE DISEASE OF YOUR ANIMAL.

National Stock Food Company,
OTTAWA, Ont.

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE
AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 100,940
ENGLISH, 9,525
FRENCH, 91,415

Volume 18 FEBRUARY 1st 1915 Number 8

EDITORIAL

OUR OPPORTUNITY AND OUR DUTY

AS the Hon. J. Edward Caron, Minister of Agriculture, said recently at Sherbrooke:— "In spite of the trials and troubles of the present time, this is probably the best opportunity that our farmers have had for a long time to work effectually to increase their own prosperity, and it is to be hoped that all will do their utmost to increase their production, not only in their own interest, but also as an act of loyalty towards our country and the motherland. During the war, and for some years afterwards, agricultural products will be in greater demand than ever, for the good reason that the countries affected by the war will cease, during the coming year, to produce the five hundred million bushels of fall wheat which they have formerly furnished."

PATRIOTISM AND PRODUCTION

ON another page appears an advertisement entitled PATRIOTISM AND PRODUCTION, calling attention to a series of meetings to be held shortly throughout the country having for their object increased production of farm products. The speakers will be mainly agricultural experts who will tell how the farms can be made to produce more of those articles that are specially needed at this crisis of the Great European War.

This war is no mimic affair; every Canadian should fully realise the seriousness of the situation, and its meaning to himself, his country and the Empire, and should stand prepared to do his utmost.

The Empire needs more farm products, and the farmers of Canada can save the situation if they rise to the occasion NOW. They are in a position to show their patriotism and a full sense of their responsibility by doing everything in their power to increase their productions.

The greater the patriotism, the greater the production. At the same time there is an unprecedented opportunity of establishing an extensive export trade through the development of our agricultural resources. It is more than likely too that as a result of this concerted action for an increase of farm products many of the difficulties which retarded the progress of agriculture in the past will be removed.

RURAL CREDITS

FRENCH-SPEAKING Quebec has, among other things, the credit of establishing on a sound working basis the first system of co-operative rural banks in Canada. In this connection, an account of Mr. Desjardin's notable work was given by himself in the October number of the Journal of Agriculture. Mr. Desjardin's article is worthy of careful study at the present juncture when special efforts are being made to stimulate farm production, inasmuch as it deals with an aspect of the question which should not be overlooked.

Our present banking system, we must concede, has been organized with a view of meeting the requirements of the manufacturing industries and commerce, not those of the agricultural industry. It is strange that our far-seeing legislators and statesmen have not seen before this how the banking system tells against the farmer and against the best development of the great basal industry of the country. The farmer needs *long-time credits* to make the more costly necessary improvements which are slow in bringing in returns. He needs also *short-time credits* to help him to market his produce to the best advantage or to tide him over an unfavourable period. Such credits are at present hard to secure and even then at high rates.

It seems to us that such treatment of the farmer militates against the best interests of the country. Now is the time for the Government to come to the farmer's assistance, especially when he is being asked to increase his output of grain and live-stock. "The country will not be satisfied until it has a banking system as well adapted to agriculture as our present system is to commercial business, providing (1) for long term payments on land, (2) short time credits on supplies so as to escape time prices and (3) provision for marketing crops so as to avoid congestion and panics."

CROPS THAT GIVE SEVERAL PROFITS

AT this time when the farmers are urged to increase the amount produced on their farms, it is our first duty to consider what crops give the best profits. By the term profits are understood not only the value of the yield directly and indirectly, but also the value of the residue left in the soil and the condition of the soil. From this standpoint it is clear that crops such as clover, alfalfa and corn are much more profitable than wheat or oats. These crops have been called the "five profit" crops, inasmuch as they give five profits where wheat gives one. Let us look for a minute at the five profits. They are (1) the *crop* itself; (2) the *products*—milk, butter, beef, eggs, pork or horse-power—that can be manufactured from the crop; (3) the *manure*; (4) the *preparation* of the land for a crop of grain; and (5) the *distribution* of work and income.

With regard to the value of the crop itself, most farmers will acknowledge that a clover, alfalfa or corn crop is at least as valuable as a wheat or oat crop. It is, however, the high value of the clover, alfalfa or corn crop when fed to stock and manufactured into milk, beef, pork, etc., that commends these crops to the attention of the farmer. The profits in this connection are usually high, and the labour involved can be mostly arranged for at times which would otherwise be largely unoccupied.

Again, the value of the manure arising from the feeding of clover and corn crops and the manufacture of milk, beef, pork, etc., is very high. It is computed that four-fifths of this plant food that is fed is returned in the manure.

The chief difference, however, between such crops and grain crops lies in the condition of the land after harvest. We all know how clover and alfalfa enrich the soil in nitrogen and humus, and how the cultivation given the corn saves moisture, and kills weeds. As a matter of experience clover or alfalfa is essential to a good grain crop, and corn or roots to a good clover or alfalfa crop. In other words, corn, clover, and alfalfa prepare the land for a crop of grain, and are of the greatest value when grown in rotation with the grain crops.

Finally, the growing and feeding of corn, clover and alfalfa make for economy on farms. Their use makes it possible for a distribution of labour over the whole year instead of over a portion of the year, with the result that work is done more efficiently and at less cost. Besides, the business becomes largely a cash business with money coming in at all times of the year, with the result that the necessary buying can be done more cheaply than is done on credit.

While, therefore, not discouraging the production of wheat and oats we should remember that in a permanent agriculture other crops are often far more valuable, yielding as they do several profits instead of one.

THE SHORT COURSES

IN every community three types of farmers are readily recognised—the *up-to-date*, the *indifferent*, and the *poor*. The first and last types are not so numerous as the second. The great sin of farming to-day is indifference. There is such a large number of farmers who take but little interest in agriculture either as a science or as an art, and who appear to be content with the kind of work they are doing. There are some hopes for the improvement of the porr farmer, for he is usually willing to learn and to put into practice what he has learnt.

The Short Courses recently held in several of the English-speaking sections of the province are valuable (1) in giving practical agricultural information to those who need it, (2) in awakening the indifferent farmers to the losses they are bringing upon themselves through their indifference to the latest teachings and best practices, and (3) in conferring with the up-to-date farmers whereby both lecturers and farmers gain by mutual exchange of ideas.

The Short Course meetings were well attended, the average attendance at each meeting for the 58 meetings being 58. This speaks well for the

CONTENTS

EDITORIAL.—Our Opportunity and our Duty; Patriotism and Production; Rural Credits; Crops that give several profits; The Short Courses; Are orchards worth while?; Agriculture the basic industry; Agricultural progress; Free Short Courses in Horticulture and Poultry.

ORCHARD AND GARDEN.—Annual Meeting of the Pure Maple Syrup and Sugar Co-operative Agricultural Association; Free Short Course in Horticulture; Seasonable Notes on Floriculture; Our Fruit Industry; The Apple Maggot or Railroad Worm; Insects and Birds; Feed the winter birds; Quebec Provincial Nurseries; Forest Planting in Quebec.

FARM AND FARM CROPS.—Macdonald College Short Courses in Live-Stock, Field Crops, Horticulture and Poultry; Farm Weeds; Farm Losses; A Concrete water tank; The making of Mortar; The construction of an Ice House; Shingles; The Farmer's Ice Harvest; Harvesting the Ice Crop; Seeds, Weeds and Feeds.

LIVE-STOCK.—Conserve the Breeding Stock; Federal Assistance to Horse Breeding; Canadian Ayrshire Breeders' Association Annual Meeting; Annual Meeting of the Quebec General Stock Breeders' Association; Progress in Cow Testing; The place for Silage; Official Records of Holstein-Friesian Cows; Swine; Rations fed by Ohio and Wisconsin Dairymen.

DAIRY.—Quebec Cheese; Suggestions for the Improvement of the Montreal Milk Supply; Successful Dairymen imitate month of June; Is Machine milking a failure in Quebec?; The Outlook of the Dairy Farmer in Eastern Canada.

POULTRY.—Free Course to Poultry Raisers; The Selection of Eggs for Incubation; Poultry Trade Meeting; Variety of Food makes Hens lay more often.

WOMAN'S WORLD. — Homemakers' Clubs; Foods and Food Preparation; Macdonald College Short Course in Home Economics. Make your Marmalade now; Artificial Silk; The Children's Homer; Little Talks to Housekeepers.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

new interest that is being taken in agriculture in this province. A general account of these meetings will be found in another part of this number.

ARE ORCHARDS WORTH WHILE?

THIS question all farmers no doubt have asked themselves many times. Some have decided in the negative after a trial extending over several years. They have planted, and they have had their returns which were very disappointing. They have seen their trees killed by the severe colds of winter, by the droughts of summer, by caterpillars and by disease. They have watched their fruits become disfigured by worms and by scab. What decision could these farmers arrive at than the one that orchards are not worth while?

Other farmers, however, think otherwise, also after an experience of many years. Their labours have been rewarded by a fair crop of luscious fruit, which not only brought in a goodly revenue but also helped to make living on the farm pleasant in more ways than one.

How can we account for the two totally different attitudes? It is the old story over again of the importance of *knowing how* as a factor of success. In the one case there was something wrong in the planting and the care of the orchard; in the other case the planting and the care of the orchard were properly carried out. In the one case, perhaps, varieties were planted which were not adapted to our climatic conditions, or perhaps the land or the exposure was not suitable for orchards. Perhaps the trees were not properly protected and nourished before they reached the fruiting stage. Perhaps they were not pruned or sprayed. All of these sins of omission are fatal to the growing of fruit-bearing orchards, yet attempts are being made in every districts to grow orchards under these handicaps. Meetings without number have been held, and much literature has been published, to acquaint the farmer with the proper methods of handling an orchard, but to a large extent without marked results.

In this matter of fruit-growing may we not expect better results from the efforts of the County Demonstrators? Their personal touch with the farmers may be of value in dealing with orchards that are not doing well. There is no reason why the farmers of this province cannot have good orchards, providing they treat the trees properly.

There is another and an important reason why orchards are worth while. A good orchard enhances the value of a farm much more than the bare market value of that orchard. It appeals to the home-lover as a thing of beauty and carries tender associations of children playing under the blossoms, with the birds singing and nesting in the leafy branches. Yes, orchards are worth while.

AGRICULTURE THE BASIC INDUSTRY

IN these war times the importance of agriculture is being emphasized as has never been done before. The farmers are being urged to expand their undertakings, to prepare more land for growing cereal crops and to raise more live stock. That they will respond there is little doubt, for they are as willing as any other class in the community to show their patriotism in this great crisis. The farmers of Canada realize fully that if Great Britain can be kept supplied with food-stuffs for her people and her armies ultimate victory will come to her and her allies.

For many years Canada followed the example of England in trying to build up her manufacturing industries, allowing agriculture to develop the best it could without special help. The result is well known; the cities have grown and the rural districts have decreased in population in spite of the large influx of immigrants. The money made on the farms, instead of being used to improve them, has been taken to the cities to build up great manufacturing enterprises, and the young men from the farms have been attracted by better wages to the cities.

One can readily imagine how vastly improved the situation would be now if agriculture had not been neglected in past years. The output of the farms of Canada to-day would be immensely greater than it is, and might be sufficient in itself to supply the needs of the Mother country.

We realize fully that this question of agriculture vs manufactures is one that has been the cause of much political strife in Canada. Our leaders, however, may very well learn a valuable lesson from Germany in this very matter. In a recent work entitled "Imperial Germany", Prince von Bülow, Imperial Chancellor for twelve years, discusses the important question of Industry and Agriculture. Germany was developing rapidly in industries and commerce, but at the expense of agriculture, and was growing in wealth and influence. There was a great temptation on the part of her legislators to give all their support to this phase of her development and to let agriculture fall. Bülow, however, brought in a Bill in 1902-3 to rearrange the tariff so as to encourage agriculture. He met with fierce opposition from the industrial leaders, but finally the new Tariff Bill became law. The result was that both agriculture and industry were able to thrive. Bülow was wise enough to see that the truism "wealth alone does not bring happiness" applies to nations as much as to individuals. He says "Nations also can only enjoy increased wealth if they have a sound mind in a sound body. By material means alone a nation can neither maintain its place in the world nor advance it. Physical, moral and mental health are still the greatest national riches. Agriculture is the mother of the nation's strength which industry employs, the broad acres in which the trees of industry and commerce stand, and from which they derive their nourishment."

In other words, Bülow realized fully, as some of his critics did not, that a prosperous agricultural class is not only a strong economic power but also a social factor which cannot be overlooked. Already urbanisation had produced in Germany its baneful degenerating influence on the physical well-being of the people. If a nation is to live long it must keep healthy.

By compromises Bülow passed his Tariff Bill under which both industry and agriculture thrived. Likewise it seems to us it could be possible by compromise to effect a working basis for the development of both industry and agriculture in Canada; but above everything else it should be borne in mind that neglect of agriculture spells economic and social loss to the country.

AGRICULTURAL PROGRESS

What our Experts are Thinking, Doing and Saying. More Business than Usual

(Extracts from recent Addresses at Conventions)

"WHEN the country people re-discover their own schools and get their eyes opened to the rich possibilities that lie in education of the right kind for them as farmers, we are going to see a great advance in rural Ontario and the cause of agriculture. We may have to wait until the next generation makes its influence felt, but the country leaders who are developing in our schools through the proper teaching of agriculture will undoubtedly exert a great influence when they arrive."

Professor S. B. McCready, Director of Rural Education, Ontario, at the Ontario Experimental Union

"The call of Britain is "Business as Usual", and it is a good slogan, for Britain is a business country; and if she can fight on land and on sea and at the same time carry on business as usual she

THE GARDEN AND ORCHARD

ANNUAL MEETING OF THE PURE MAPLE SYRUP AND SUGAR CO-OPERATIVE AGRICULTURAL ASSOCIATION

THE annual meeting of the Maple Sugar Makers' Co-operative Association was held in Beauceville on January 12th. Mr. Charles A. Fisk, the Vice-president, occupied the chair. Addresses were delivered by Mr. Gustave Boyer, M.P., Vaudreuil; Mr. H. Nagant, Editor of "Le Journal d'Agriculture", Quebec, who was present to represent the Hon. J. E. Caron, Minister of Agriculture; Mr. J. H. Lefebvre, Waterloo, Que., Secretary of the Association; Mr. L. J. A. Dupuis, Village des Aulnaies; and Mr. Edward Fortin, Beauceville, editor of "L'Eclaireur."

Mr. Boyer emphasized the profitableness of the maple industry and the advantages of co-operation. In his own little county of Vaudreuil in 1912, 128 farmers tapping 95,965 trees had made 13,740 gallons of syrup and 18,711 pounds of sugar. The province produces 20,000,000 pounds of sugar annually, and the amount could easily be doubled by co-operative effort.

Mr. Nagant expressed the interest of the Quebec Minister of Agriculture in the advancement of the maple industry and expounded the new Dominion law against adulteration.

Mr. Lefebvre urged upon the audience the importance of careful work in making maple syrup and sugar. The county of Beauce is losing $250,000 a year through not understanding how to take advantage of the valuable natural resource it possesses in its maple woods. More and better syrup and sugar should be produced. One thousand maples, he maintained, pay as well as ten cows. Mr. Lefebvre also spoke upon the utilisation of maple sugar sand, a product for which there is now a demand on the part of chemical manufacturers who make from it malic acid and other materials.

Mr. Dupuis called attention to the exhibits of the Grimm Manufacturing Company, the l'Islet Sugar School and the Dupuis sugar bush which were displayed in the hall, and gave a practical talk upon the methods of making syrup and sugar.

Mr. Fortin referred to the influence this association of about 350 members already exerted upon the Governments at Ottawa and Quebec and asked what would this influence be if the association numbered 3000, as it might easily do if our sugar makers generally realized the importance of co-operation.

The following officers were elected for the ensuing year:—

President:—Gustave Boyer, M.P., Vaudreuil.
Vice-President—Chas. A. Fisk, Abbottsford.
Secretary—J. H. Lefebvre, Waterloo.
Directors—J. H. Grimm, Montreal.
R. T. Brownlee, Hemmingford.
L. J. A. Dupuis, Village des Aulnaies.

---

will be doing well. But Canada is a food-producing country, and therefore the slogan "Business as Usual" will not do for us. Let me give you another—"More than Usual"."

Dr. C. C. James, C.M.G., Agricultural Adviser, Dept. of Agriculture, Ottawa, at the Eastern Ontario Dairy Convention

"It seems that the question of the percentage of fat in the milk is being neglected too much, as this year again we find that the average test for Ontario has been lowered by .02 per cent, and so it has taken two-tenths of a pound more milk to make a pound of cheese than it did a year ago."

G.G. Publow, Chief Dairy Inspector, E. Ontario, at the Eastern Ontario Dairy Conv.

"Lean soil means lean, hungry stock and a man who carries a lean pocket-book. A rich, fertile soil means well-fed live stock and a man who carries a fat pocket-book or a good bank account."

"Canada's four C's in dairying are: Clover, corn, cows, and cheddar cheese."

"Farmers need to study the cow far more; need to select and test; weed and breed, and the interest that will be found in doing these things will make a pleasurable and a profitable thing of farming. Cost of production and a study of the other branches of economical production and distribution must be studied. Dairy farming must be placed on a sound business basis."

Prof. H. H. Dean, O.A.C., Guelph, at the E. O. D. Convention

"Cheap feeding means abundant feeding at all times and feed produced at the lowest cost."

"Every farmer should have one or still better two hired men a year. If we have not, it means we are novices and not doing what we should. In Europe the men farm with their heads, and have four or six men working for them. They are able to make 500 or 600 pounds per year instead of $150 as here."

"Cheap feeding means proper feeding. The common feeds required are clover hay, alfalfa, straw, silage, and grain feeds. We cannot afford to buy the latter lavishly, but must feed the coarse feeds that can be produced on the farm. Trusting to pasture grass is a big mistake in Eastern Canada, as only two months of good grass are available. We should make it a secondary consideration, and should grow green feed to supplement it. Pasture is expensive unless the land is non-tillable."

J. H. Grisdale, Director of Dominion Experimental Farms, Ottawa, at the E. O. D. Convention

"The work of the farm can be kept up to date by quitting in time to do the chores before 6. I am sometimes asked what I should do if I were alone without help or with insufficient help on a 75 or 100 acre farm, where it would be physically impossible to do the work in 10 or 12 hours a day. My reply has always been that I would either manage the farm so that I could afford to employ sufficient help or quit the job. Long hours are more often a habit than a necessity."

Professor J. B. Reynolds, O.A.C. Guelph, at the E. O. D. Convention

"Are we, as factory managers, giving the patrons a stronger inducement to produce better and more milk? Why shouldn't we give our patrons more money for better milk? Educational literature is all right, but grading the cream is worth all the bulletins, etc., put together. Give the good producers better pay than the poor producers. If we could give a little more money for richer milk, we would start the producers thinking."

George H. Barr, Chief Dairy Dept., Ottawa, at the E. O. D. Convention

FREE SHORT COURSES IN HORTICULTURE AND POULTRY

MACDONALD COLLEGE offers the following short courses in 1915:—

1. HORTICULTURE — at Macdonald College, February 8th to 12th.
2. POULTRY—at Macdonald College, February 15th to March 6th.

The object of the short courses offered by Macdonald College is to try to reach the farmer and enable him to improve his prospects and to increase his income.

Many farmers and farmers' sons have not the time to take a regular college course lasting two years or more, but there are many who could find time, at the slack season of the year, to take one or more short courses in one or more branches of agriculture. Macdonald College, in order to help such men, offers lectures in stock and seed judging and short courses in horticulture and poultry keeping.

Farmers wives and daughters are invited to take the lectures in horticulture and poultry.

Each course will contest of lectures, discussions, illustrations and demonstrations with materials suited to the courses.

For the Courses in Horticulture and Poultry to be held at Macdonald College men and women students will be received, but none under 18 years of age. There is no other age limit. A registration fee of $1.00 per course is required in advance.

There are no examinations for entrance or at the end of the courses.

Write for illustrated bulletin to

The Principal,

Macdonald College, Que.

FREE SHORT COURSE IN HORTICULTURE

Macdonald College

Feb. 8th to 12th, 1915

A free short course in Horticulture will be held at Macdonald College, Feb. 8th to 12th, inclusive. This course is intended to give practical information on Fruit Growing and Vegetable Gardening to business men and farmers who have not the time to devote to a longer course. In addition to the regular lectures considerable time will be given to a discussion of the different subjects and the answering of questions.

Such subjects as the following will be taken up: *Fruit-Growing:*—

The Apple Orchard, Planting, Management, Renovation, Pruning, Spraying, Box and Barrel Packing demonstrated, and the Marketing of the fruit; Plum and Cherry Culture; Strawberry, Raspberry and Current Culture.

Vegetable Gardening:—

Potato Culture; Onion Culture; Peas and Beans; Up-to-date Methods of Gardening; Ten Acres of Intensive Gardening with Vegetables and Small Fruits; and Gardening, Illustrated.

General:—

Improvement of the Home Surroundings; Fungus Diseases of Fruits and Vegetables; Insects and How to Combat them; and Demonstrations in the making the Lime-Sulphur Wash and the Bordeaux Mixture.

The greenhouses will be visited from time to time where many different flowers and vegetables can be seen and studied. The course will be made as practical as possible and many subjects will be illustrated by actual demonstrations.

The course is open to all, both men and women. Board and rooms can be secured near the College at very reasonable rates. Remember the date, Feb. 8th to 12th inclusive.

For further particulars address:

Dr. F. C. HARRISON, Principal or
T. G. BUNTING, Professor of
Horticulture,
Macdonald College

SEASONABLE NOTES ON FLORICULTURE

Treatment to be given such House Plants as Calla Lily, Hydrangea, Fuchsia, Geranium, Pansy, Petunia at this season of the year

THERE should be no scarcity of flowers in the homes at present, as hyacinths, tulips and narcissus will be making things gay. Freesias also will be in flower at this time, adding their beauty and fragrance to the home. As this plant goes out of flower continue to give it a bright situation and attend carefully to the watering as it has to finish its growth gradually. When the foliage begins to turn colour, gradually give less water, finally withholding it altogether. A few hints will be given later on this subject.

The *Calla Lily* will be flowering right along for some time yet. This plant is a gross feeder and will require to be fed regularly with liquid manure or other plant-food if best results are to be obtained. In order to lend variety and to keep up a supply of flowering plants time has to be taken by the forelock. If you have a few Hydrangeas or Fuchsias that have been resting in the cellar bring one of each up to the light and heat and start into growth. The *Hydrangea* will require little, if any, pruning, the *Fuchsia* on the other hand should be pruned into shape, and allowed to grow in a bright window in a warm room. The Hydrangea will not require repotting at this time, the Fuchsia, however, after the young growths are fairly started should be turned out of the pot and as much of the old soil removed as possible, being careful not to break the fresh roots. Repot into same size pot if possible, and later if growth warrants it move to a larger pot. These plants if started now will be in flower by the end of April or early in May.

Geranium for winter flowering. Now is the time to lay the foundation of plants that will give abundant flowers throughout the fall and early winter. Plants that have flowered from October until now have done all that can be expected of them, therefore they should be rested for 3 or 4 weeks before again starting them into growth. To rest them, withhold the water supply and treat in a cool dry place; give enough of water to the soil to keep the wood from shrivelling. Before resting these plants, however, take a batch of cuttings from them, that is to say, take a number of the young growths about 5 inches long, remove all leaves except three at the top of the cutting, and with a sharp knife make the base close below a joint; place the cuttings around the side of large pots of sandy soil, firming them well. Keep the soil moist and roots will form very quickly. Pot up separately in small pots when well rooted, repot as required and in May give the final potting using 6 or 7 inch pots. During the summer the plants will require to be cut back twice at least in order to form bushy plants; also keep all flowers picked off until the middle of August when they may be allowed to grow unrestricted. These plants will come into flower by the end of September and continue in flower until February, if given a bright situation. The old plants already referred to, after being rested for 3 or 4 weeks may be grown on the second year and make excellent plants of large size. Prune each growth back to within two or three buds, and keep the soil rather dry for a few days until the pruned part heals over, after which give the soil a thorough soaking. Repot after growth has commended and treat similarly to young stock.

Pansies. If these had not been sown outdoors late in the summer and planted out where intended to flower in the fall, now is a good time to sow in order to have plants that will give a wealth of flower early in the summer. Sow the seeds broadcast on the surface of a well-prepared box of sandy soil, covering the seeds evenly to the depth of ⅛ of an inch with very sandy soil. Water the box thoroughly and give a warm temperature until the seedlings appear, after which treat in a cool temperature (50 degrees) and give a bright situation to encourage sturdy growth. When the seedlings have formed their first pair of true leaves, other than the seed leaves, transplant singly 3 inches apart into other flats of fairly rich soil, water carefully and grow along in a bright window in as cool a room as you have. By the end of April the plants will benefit by being placed outdoors in a cold frame where they will get cool and airy conditions which will harden them off before planting out permanently early in May. The pansy will stand frost but being raised in the house they are tender and require to be inured gradually to outside conditions. Handled in this way they will commence flowering soon after planting, and if planted in a semi-shady situation and the soil kept moist during dry weather they will flower more or less the whole season.

Hydrangeas are showy plants which can be had in flower from April until August. The later (July and August) plants flower out-doors. The plants shown here were grown for Easter indoors.

Petunia. This is a well known plant that flowers the entire season. In order to have plants that will commence flowering early in June seeds should be sown in the house or under glass by the end of the month. Sow and otherwise handle them as advised for Pansies.

A.H. WALKER,

Florist, Macdonald College

OUR FRUIT INDUSTRY

(Extract from an address given by Mr. J. H. Lavoie, Chief Assistant Horticulturist of the Quebec Government, before the meeting of the Pomological Society held at Macdonald College.)

UNCONTROLLABLE circumstances have prevented the Hon. J. Edward Caron, Minister of Agriculture, from coming to tell you personally the interest which he feels in your Society and the splendid work which it is doing to develop, extend and improve fruit cultivation and the fruit industry.

At a time when a "return to the land" has become an imperious need for the reduction of the cost of living and for the maintenance of the social balance, in this time of financial crisis through which we are passing, it is more important than ever that the greater part of our teachings reach the whole agricultural class, so that fruit production may increase and reach with a minimum of waste the greatest yield possible. And it is in order to attain these results that the Hon. Minister of Agriculture of this province assists your society in all its efforts. He has assisted this year in distributing throughout the province several thousand copies of a masterly work entitled "Fruit Culture" by one of the most eminent pomologists of your society, the Rev. Father Leopold.

By distributing this bulletin direct to farmers who are desirous of studying the question of fruit culture, we are convinced that up-to-date methods of orcharding will take the place of the old methods, and that an abundant production will follow their efforts.

He has also assisted in introducing methods which I am sure meet with your approval in all the orchards to which we have access in the province, and in extending these methods by all the means of teaching we have at our disposal.

But it is not sufficient to infuse the science of agriculture into the public spirit and to inculcate the taste for agricultural progress. Our work is not only to promote the development of horticulture and to assist production, but we aim at the same time at creating for our productions a commercial reputation which will give them advantage in the market, and so obtain the highest prices. And it is to induce producers to make judicious classification, careful and uniform packing of the fruit for market that the Hon. Minister has expended considerable sums for the purchase of sorting machines, packing materials etc. distributed gratis to exhibitors at the time of exhibitions and to maintain expert officers for the various work of demonstration.

It was, again, in order to facilitate the sale of their products on the most advantageous conditions that the Minister invited producers to form co-operative societies, the administration of which he looks after, and which he intends to encourage in every possible way in contributing to the cost of construction or implements for their storehouses, and in obtaining the services of an expert to guide them in their operations.

The notable success reported by this expert at the preserving factory of the Co-operative Agricultural Society of Kamouraska is of a nature to convince us that the Minister could not have made a happier choice than in the person of Mr. D. J. Wood.

These are the broad lines of development which we have been able to attain in the cultivation and industry of fruit, and to which you have contributed so much.

There remain still some plans to be fulfilled. For the purchase of fruit trees it is necessary to find the most efficient means to encourage our own nursery-men in preference to those outside, and thus prevent the introduction of insects and fungous diseases new to our province.

For the sale of produce we should get into communication with the different transport companies in order to obtain from them better accommodation for the transit of fruit and a reduction of tariff.

It still remains for us to protect by energetic measures our co-operative societies in the struggle they have against the trusts formed against them. But we have faith in our efforts. Assisted by the co-operation of the members of this society, approved by the Government at Ottawa, and seconded by the Society for the Protection of Plants—twin-sister of the Pomological Society—we have reason to believe that we shall attain in the fruit culture and industry of the province of Quebec that degree of development which it possesses in certain other provinces of Canada.

THE APPLE MAGGOT OR RAILROAD WORM

THIS pest of the apple is common in certain localities in Quebec, namely at Como, Covey Hill, and Abbotsford. No doubt it is present in other districts but has not yet been reported.

The New Hampshire Agricultural Experiment Station has recently published a valuable bulletin on "The Apple Maggot" (July 1914) prepared by Professor W. C. O'Kane, Entomologist of the Station. This bulletin contains the results of observations and experiments covering three years, which results should be valuable for fruit-growers in the Province of Quebec on account of the contiguity of New Hampshire and Quebec and the similarity in their orchard conditions.

We have, therefore, thought it advisable to give a digest of Professor O'Kane's excellent bulletin for the use of our readers.

Life-history of the Apple Maggot

The life-history of the apple maggot is, concisely, as follows: The adult flies make their appearance from the first of July to the middle of August, the greater number emerging in the second and third weeks of July. About a week after the emergence of the adults egg-laying begins. The egg is deposited slightly beneath the skin of the fruit, sweet or aromatic fruit being preferred. The egg stage lasts about six days, and the maggots on issuing from their shells bore into the pulp of the apple where they continue feeding for about a month. There is great variation, however, in the time of maturity of the maggots, and the percentage of maturity forms, "a certain mellowness of the pulp being essential to their full development, this condition not being reached normally until a longer or shorter period after the apple falls. There is often a high mortality in the egg and larval stages, especially in late drops of winter varieties".

The mature maggots leave the fruit and pupate normally in the soil at a depth of one or two inches. The duration of the pupal stage varies widely — some pupae lasting until the end of the following June, about 300 days or ten months, others lasting an extra year or about 22 months.

The following diagram presents clearly the duration of each stage of the apple maggot.

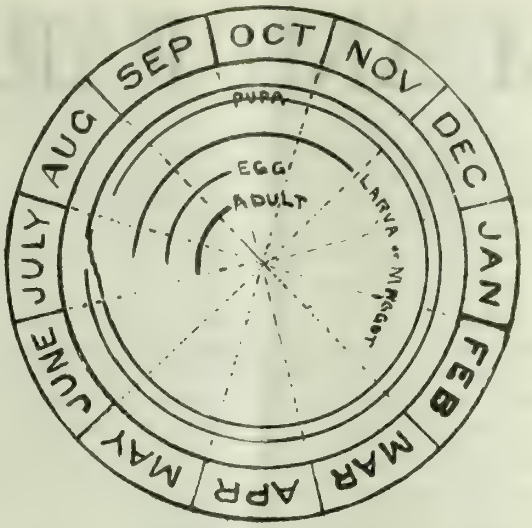


Diagram of the life-history of the Apple Maggot, showing the duration of the adult, egg, maggot and pupa stages. Note that some pupae last but 10 months while others last 22 months.

Control Measures

With regard to the control of this orchard pest Prof. O'Kane, in spite of his three years' work, found out no new effective method. His experiments with "poison-bait sprays failed entirely to ensure satisfactory protection of fruit from attack by the maggot. With five or more applications the apples often showed abundant egg-punctures. The adult flies were not much attracted to the bait, and are not poisoned in sufficient numbers to render the treatment a definite benefit in the absence of other measures of control."

The bait used contained either sugar or molasses or glucose, and the poison was arsenate of lead, the proportion of sweets and poison being varied to some extent.

Regarding the control of the pest by destroying all "drops" the writer says: "The essential point of control is to prevent infested fruit from decaying on the ground. This is the one most important step, and is an efficient check. It is the only known measure that in itself is definitely effective. This end may be accomplished by picking infested fruit before it ripens sufficiently to fall, by collecting drops by hand, or by making use of live stock to gather up drops."

Other experiments against the Apple Maggot were also tried. It was found that ordinary orchard cultivation and deep plowing had but little effect on the emergence of the adults. Moreover, compacting the soil to prevent the emergence of the adults did not prove feasible as a practical measure. The use of chemicals in the soil, such as dilutions of kerosene emulsions, Black-leaf 40, lime-sulphur, Phinotas oil, and Clift's Insecticide was hardly practicable, although but few adults emerged in some cases.—W.L.

INSECTS AND BIRDS

WHEN it is known that about two-thirds of the food of our common birds consists of insects, the agency of birds in the control of insects is of the highest importance. The seasonal diet of the robin, blue-bird, catbird, chickadee, wren, swallow, woodpecker, cuckoo, night hawk, warbler, oriole and the other birds has been carefully studied in recent years, with the result that insects form in most cases their only food, and only at certain seasons are small fruits eaten.

Birds are no doubt of special value to the farmer in nipping incipient scourges in the bud on account of their ability to move rapidly from place to place in search of food, and on account of their varied character and habits. Especially is this true of our winter birds which search every cranny and nook for the hibernating forms of insects at a season when every form destroyed means in most cases the absence of hundreds or thousands of their progeny the following summer.

W. L.

FEED THE WINTER BIRDS

FROM many quarters has the appeal been made of late to feed the non-migratory birds at such times during the present winter as it will be impossible for them to secure their natural food. It is very important that this be borne in mind. There can be no better way to prepare for such contingency than to procure at once and keep on hand grain or other food to be scattered judiciously in favorable locations at times of emergency. The protection which has been extended by law to so many of the wild birds ought to be supplemented by further provision in behalf of the beneficial birds of the winter.

However bitter may be the cold or how deep the snows, there are nevertheless a great many birds which strangely choose to remain near their summer haunts and weather out the inclement season. Indeed there are almost myriads of small birds in winter far to the north of us who have bravely elected to withstand even severer conditions of cold and storm. How all these tiny mites of life are able to find such shelter as will prevent them from perishing and obtain food enough to tide them over till spring is a mystery; and why they should seemingly prefer frigid cold to warmth beneath summer skies and scant food instead of abundance, is still a greater one.

Perhaps they have forgotten the way to the sunny south, or more likely they are aware of the perils of so long a journey which must be encountered both when going and coming. And so they remain and make the most of the short, cheerless days of winter and may be seen, if you look closely, stirring about continuously during the hours of daylight, busily searching for food.

Who are some of our permanent bird residents? Probably you would mention first the woodpecker. Often has he called your attention to his presence by a merry tattoo on some dead and hollow limb. He is verily working for dear life—to satisfy his appetite, and in doing so he is rendering a service to man that is well-high incalculable. There will be less grubs, caterpillars and borers to injure your trees and your fruit next season if the woodpeckers are working in your orchard during the winter.

The chickadees, sometimes known as titmice, are light-hearted little fellows that grace the winter landscape. They are friendly birds and general favorites, more numerous in winter than summer. They will come to your door or window if you encourage them with crumbs during the "hard times". In their quest for food they destroy myriads of caterpillar eggs, moth larvae, dormant bark beetless and plant lice.

The nuthatches and kinglets may often be seen in company with the chickadees, and together they do much to enliven the dull days of winter. Spry but not shy are these restless little acrobats—tree-wardens of such skill and perseverance as to make their presence indispensable.

The juncos, goldfinches and snow buntings need have no fears of the rigors of winter so long as the snows do not bury the weed patches. How much the farmer or gardener is indebted to these birds for keeping down the weed growth it would be impossible to overestimate.

The blue jay and crow we have with us in season and out. Noisy, cunning and mischievous as they are, said to know more about our ways than we do of theirs, there are few of us so ungenerous as to resent their presence or begrudge them of their meagre living when the fairer singers have deserted us. Indeed, the sharp and vibrant notes of these hardy birds on a frosty winter morning are words of cheer and inspiration to the most of us.

THE FARM AND FARM CROPS

MACDONALD COLLEGE SHORT COURSES IN LIVE STOCK, FIELD CROPS, HORTICULTURE AND POULTRY

Meetings well attended; Considerable Enthusiasm manifested; Practical Instruction appreciated

(By our special Reporter).

SHORT Courses in agriculture have become an institution of great importance throughout the world. Improved methods and advanced farming in general make a great demand not only on the practical ability of the farmer, but they also require on his part a certain amount of theoretical knowledge. The farmer of to-day is not and cannot be satisfied with merely knowing "how"; he must of necessity also know "why."

Realizing this fact and endeavouring to meet the demand for increased knowledge, widely expressed among the farmers of the province of Quebec, the College authorities have arranged short courses for a number of years at the College or at various centres in the province.

This year one-day courses were held in twenty-one centres, comprising Knowlton, West Shefford, Bedford, Magog, Coaticook, Ayer's Cliff, Scotstown, Sawyerville, Marbleton, Danville, Richmond, South Durham, Hemmingford. Athelstan, Kensington, Lennoxville, Waterville, Calumet, Chapeau, Elmside and Breckenridge. Lectures and demonstrations commenced early in the afternoon and continued until "chore time". The evenings were taken up with lectures, discussions and demonstrations

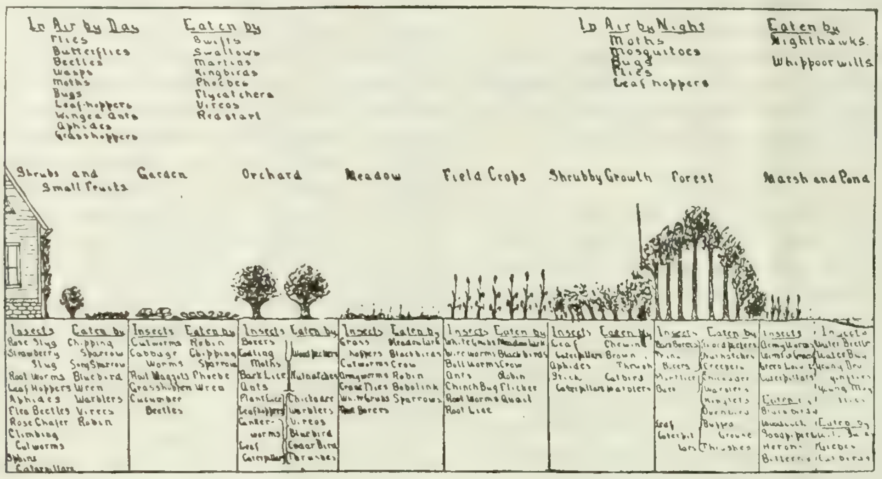


DIAGRAM ILLUSTRATING THE RELATIONS OF BIRDS AND INSECTS ON THE FARM
From Weed and Dearborn's "Birds in their Relations to Man."—J. B. Lippincott Co.)

But there are times of stress for all these winter pilgrims—days when the snow-drifts have buried the food supplies of some, and the driving freezing sleet has locked up the storehouses upon which others are wont to depend. It is, then, not a question of the severity of the cold nor of shelter with the birds that winter with us, but rather a problem of finding a continuous food supply. The establishment of feeding-places for the birds in suitable localities is good economic policy; the recipients will be grateful for such service and will reward you when you, too, are in need of their help.

W. M. Morrill in 'Our Dumb Animals'

QUEBEC PROVINCIAL NURSERIES

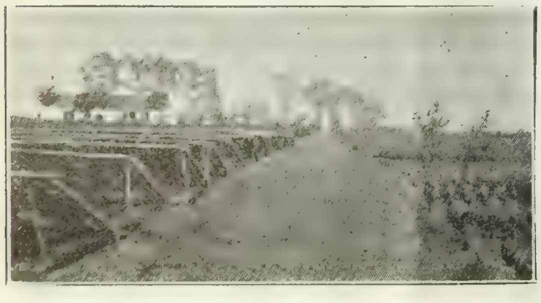
Description of the Forest Nursery Station at Berthierville

THE Secretary recently paid a visit to the Quebec Government Forest Nursery near Berthierville. This nursery, which consists of about sixty acres, is situated on the north bank of the St. Lawrence River near the town of Berthierville, and nearly opposite the city of Sorel. The site is well chosen both as to the character of the soil and for convenience in shipping the little trees by rail and water. The farm house and barns have been fitted up for the use of the resident forester, and accommodation is provided for the students who in the spring do the work of preparing the beds, sowing the seed and transplanting the seedlings into the nursery rows.

The species chiefly grown are pine and spruce. White and red pine occupy a large place, and the nursery is also making a thorough test of Scotch pine, which promises to do particularly well in the Province of Quebec. Tamarack and European larch are also grown extensively, and another conifer that promises well is the red fir, the seed of which was brought from Idaho. Of deciduous trees, the ash, elm and maple are the chief representatives, black walnut six years from the seed is about nine feet high, and some European walnut planted two years ago is also making good growth. As an experiment there are some specimens of tulip trees or yellow poplar being grown, and while this tree has been frozen down the last two winters to about three feet above the ground, it is hoped eventually to acclimatize it.

The Secretary was shown over the nursery by Mr. G. C. Piché, Chief of the Forest Service, who pointed out that the nursery had now reached a size of five hundred beds. In these there were a few failures, but in nearly every case the reason for these was known, and as the work proceeds these can be avoided in future. The nursery has also been equipped with a water system which will materially improve the working conditions.

Can. Forestry Journal



View in Quebec Government Nurseries Berthierville, Que., looking toward St. Lawrence River.

FOREST PLANTING IN QUEBEC

LAST year a total area of twenty-one acres was planted. This year with twelve students working at the rate of about eight to ten thousand seedlings a day twenty-five to thirty acres were planted. Mr. Laliberté, under whom the work was done, estimates that the cost was approximately $15 per acre, but as this was incurred in a short time and the overhead expenses were great, it is far in excess of what can be ordinarily accomplished. The cost, if the planting were undertaken on a large scale, should be only about five or six dollars an acre. It is well within the range of possibility that a large sand area of some thirty-six square miles near the present plantation may be planted up in the course of the next few years by the Government. It is a distinct menace to the surrounding country, and the experiments already carried out, including those of farmers between the bad lands and the town of Lachute, show that it is quite possible to prevent altogether the drifting of the sand.

Quebec Government plantations at Lachute, Quebec.—Foresters at work planing trees.

Quebec Government plantation at Lachute, Quebec.—A bunch of beach grass, which is found useful in holding the soil so that young trees may get a start. Note the sand around the roots. The Quebec Government has ordered two kilogrammes of this seed from France.

The Quebec Government is anxious to carry on this work for many reasons, chief of which, in addition to that of subduing the drifts, is that it provides an obect lesson and a considerable amount of encouragement to farmers who plant up their own lands. In the Government nursery at Berthier, Que., there are millions of seedlings available for such enterprises, and Chief Forester Piché is anxious to place them in good hands. At the present time the arrangement between the farmers and the Government is that the Government buys the land at $1 an acre, plants it with trees and undertake to return it to the owner if he cares to buy at the end of eight or ten years for the cost of production. In no case is the purchase price in this second instance to be over $10 per acre.

The Lecturers who took part in the Macdonald College Short Courses in Live Stock, Farm Crops, Fruit-growing and Poultry-Keeping.

In the back row from left to right are: A. H. MacLennan, A. R. Ness, L. C. Raymond, A. C. Gorham and P. A. Bowing.

In the front row are: M. A. Jull, Professor Barton, R. Summerby and Professor Bunting. Messrs Bergey and MacMillan do not appear in the illustration.

with lantern slides. These meetings were by no means one-sided affairs, with one man speaking and the others listening. From time to time questions were asked by the audience, causing a lively exchange of opinions, and we feel sure that in many instances the men who had come to teach benefited just as much from the discussions as those who had come to learn. The more the college man gets in touch with the farmer, and the more he knows about the problems right on the spot, the better will he be able to serve and help the man on the soil.

Most of the lecturers who took part in the work are well known among Quebec farmers, and readers of the Journal will undoubtedly recognize their names, which have from time to time appeared under articles on different topics. The speakers from the Animal Husbandry department were Professor H. Barton, A. R. Ness and A. A. McMillan, in charge of sheep husbandry. The Cereal Husbandry department sent out R. Summerby, L. C. Raymond and P. A. Boving, in charge of root crop investigation. Professor T. G. Bunting, H. H. MacLennan and A. C. Gorham, of the Horticulture department, spoke on subjects pertaining to the garden and orchard; and Mr. M. A. Jull, manager of the Poultry department, discussed the poultry question, ably assisted by S. Bergey and Miss L. Nicholson. In most of the places mentioned special lectures for farmers' wives and daughters were given by the ladies of the Household Science department.

GOOD WORK OF THE COLLEGE DEMONSTRATORS

All meetings were partly arranged by the college demonstrators, who most ably assisted in different ways to make the 1915 short courses a decided success. Messrs J. K. King and A. E. Raymond have both gained a high reputation for themselves and for the College in the Shawville and Cookshire districts. Mr. E. A. Lods who succeeded Mr. McClintock in Cowansville, has only worked in this district for a comparatively short time, but is already well known among the farmers in Shefford, Brome and Missisquoi. Mr. V. B. Durling is doing good work in Richmond district where he substitutes Mr. C. H. Hodge, who is at present engaged in work at the College. Mr. A. F. Emberley has an entirely new district in Stanstead County, with headquarters at Ayer's Cliff, and he has good facilities for gaining a reputation in this locality. In Huntingdon we heard favorable comments on the activities of Mr. R. E. Husk, and the farmers of Lennoxville district seem to be well satisfied with their new demonstrator, Mr. W. G. MacDougall.

Several numbers of the Journal could be filled if an extensive account were given of the proceedings at only one single place, but we must content ourselves at present with a very brief summary of a few of the topics. Each of the college lecturers had a good selection of subjects on his programme.

PROFESSOR BARTON

Professor Barton can always be sure of a good hearing, and the farmers greeted him as an old acquaintance everywhere he went. Among other things he spoke in his usual forceful and convincing way on "Breeding for Live stock Improvement", and "The proper Choice of Feeds."

"It is a regrettable fact", said Professor Barton on one occasion, "that we in Quebec are generally so short of feed. This is true not only in regard to concentrated feeds but also in regard to roughage which is a much more serious thing. At the same time too many of our farms are understocked, but what is worse still, a great deal of our stock is of decidedly inferior quality and poorly fed. How, then, can be attack the problem? Improve the quality and increase the output. There is nothing to prevent us from rapidly improving our live stock, in fact there are many things at work greatly simplifying the process, but this is a subject in itself.

"Our small output in feed, with the consequent shortage, has its origin in more than one factor: poor cultivation and lack of drainage are two important ones starting us in the face on almost every hand. The time has come when more thoroughness in our practice is imperative. The choice of crops and the proportion of the farm allowed to various crops is a question in need of revision. Corn and other hoed crops are our salvation, and we do not half appreciate them. We have far too little corn and too few silos. Roots and clover go hand in hand with corn. A general introduction of these crops may mean added labour, but it also means added manure, and both will go to make a better showing in higher returns of other crops and increased profits from the farm. An important phase is the selection of purchased feeds. The common practice in the dairying centres of Quebec is to purchase large amounts of concentrated feed for winter milk production. A great deal of money is spent in this way, and too often the expenditure is not as judicious as the small chance for actual profit demands. Personally I like to grow as much as possible, but up to a given point for intensive dairying I favour the purchase of concentrated feed on the average farm. Some of the richer protein feeds cannot be grown and are necessary for best results. Such feed is available in large quantities; and as a source of farm fertility, which so many farms need even for the general crop. I prefer it in so far as is possible to commercial fertilizers, although they too may have their place for certain crops and soil conditions."

R. SUMMERBY

Mr. R. Summerby, lecturer in the Cereal Husbandry department, hails from this province and knows its conditions and needs well. At various points Mr. Summerby spoke on the following subjects:—"Alfalfas and Clovers", "Corn and Roots", "Clover Growing and Seed Production", "Grain Growing in Quebec" and "Some essentials in Soil Management". Alfalfas and clovers were discussed with reference to their high value as feed, as soil improvers and as crops in rotation. Essential points in their successful culture which were ably emphasized are drainage, freedom from acidity, clean soil free from weeds, and finally proper and thorough preparation of the seed bed. "The alfalfa", Mr. Summerby said, "is a peculiar plant in many ways, not least in its relation to other plants. In some instances it does not do any too well in good company, i.e. sown together with clovers and grasses; and it absolutely refuses to make a showing in bad company, in which category weeds must be counted." Other points of importance are the sowing of a good quantity of seed, the avoidance of grazing in the fall, the selection of hardy varieties, such as Grimm's alfalfa and the growing of our own seed. In order to produce good seed of clover and alfalfa the fields should be free from weeds which is partly achieved through early cutting of the first crop for hay, and subsequently the second crop should be handled properly. For the production of the highest yield of ensilage corn of good quality early maturing varieties were recommended. "Early Leaming", where really early strains of this variety can be secured, "Wisconsin No. 7" and "White Cap Yellow Dent" are all good dent varieties, suitable in favourably situated corn districts; in localities with shorter seasons the flint varieties such as "North Dakota", "King Philip" and "Longfellow" are preferable. Corn bought on the ear gives better satisfaction and more reliable results than shelled corn purchased in the bag. Fall preparation was advocated for all land excepting light well drained soil. These factors, together with good spring preparation, comparatively thin planting and frequent cultivation during the summer for the conservation of moisture and the destruction of weeds were pronounced as the most influential agencies in the growing of good silage corn.

PROFESSOR BUNTING

Professor Bunting in his addresses at Hemmingford, Athelstan, Kensington, etc. dealt with "The Planting and Management of a Young Orchard", "The Renovation of Old Orchards" and "The Farmer's Garden and Improvement of the Home Surroundings". In all these sections there has been more or less planting of apple trees, and in some places quite extensive plantings have been made. In spite of the small amount of care given in some cases it is quite evident from the general condition of the trees that with reasonable care and attention at the proper times apple growing could be made a valuable source of revenue. During the lectures the following points were taken up — location of orchards, choice of varieties, planting, orchard cultivation and fertilizing, intercropping, pruning, spraying and harvesting of fruit. Spraying will control insect and fungous diseases and in that way help to promote the general health and growth of the tree, but in order to get reasonably good results as far as crops of apples are concerned it is also necessary to prune the trees well and to cultivate and fertilize the land. The good work already accomplished in the demonstration orchards of the province was spoken of, and these orchards illustrate what might be accomplished in many other places.

In one of his talks Professor Bunting stated that the farmer too often pleads he has not the time nor the knowledge that would enable him to undertake properly the planting of a garden. A garden is a valuable addition on any farm, and much more should be done along these lines. During the lecture much information was given on planting, cultivation and harvesting of the various vegetables and small fruits, what varieties to plant and where to obtain them.

Our reporter has on hand many more good reviews of other subjects discussed by various lecturers at the short courses, but owing to lack of space these will have to appear in our next number.

(To be continued).

FARM WEEDS

The Illustrations of Weeds in these articles are taken mainly from the Report of the Seed Commissioner, Ottawa, March 1911

Article III

GENERAL CONTROL OF WEEDS

ATTENTION has been directed in previous articles to the “ Causes of Prevalence of Weeds”, and the ‘Kinds of Weeds.’ The present article deals with the problem of General Control of Weeds in a system of farm-management, as the question of the eradication of special weeds will be taken up at another time.

Purslane, a common annual in gardens.

Prevention of Weed infestation. A farm wisely managed is seldom troubled with weeds. Emphasis is laid on the prevention of weed infestation rather than on their destruction. A system of farm management should be introduced which will give weeds little or no opportunity to gain a foothold. As stated in last article “certain weeds follow certain crops and certain methods of farming”, e.g. couch grass, ox-eye daisy, buttercup, devil's paint brush, and white-weed or fleabane multiply when timothy meadows are left down for a longer period than two years. Annuals as pigweeds, ragweed, purslane etc., are absent from such meadows, but follow cultivated crops, while the perennials that follow cultivated crops are mostly such as have creeping rootstocks that are carried by the cultivator and harrow. These are couch grass, bindweed, perennial sow-thistle, Canada thistle, etc.

Common Mustard or Charlock—a very common annual weed.

It is evident, therefore, that a suitable system of farm management should include (1) a good *rotation* of crops, (2) the *destruction of weeds* before they are able to seed; (3) the *sowing of clean seed;* (4) *clean cultivation* which includes after-harvest cultivation; (5) the *cutting of weeds* by the spud, scythe or hoe at the proper time; (6) using *manure free from weed seeds*; and (7) the *keeping of sheep* and other live stock to close-crop the weeds in pastures.

Rotation of Crops and Clean Cultivation. By means of a good rotation of crops proper cultivation can be given the land when the weeds are making a start and are readily killed. “The farmer whose scheme of rotation is mainly intent on the improvement of the land and not on his immediate profit will in the end make the most money and have the least difficulty in suppressing the weeds.” There are various systems of rotation but all are fundamentally alike in that no single crop is allowed to occupy the same land for more than a year, or at most two years, and the crops are so alternated that it is possible to do clean cultivation at intervals. The best cleaning crops are corn, potatoes and roots, and these are usually introduced after meadow or pasture. The long period of regular summer cultivation given these crops destroys any hardy perennials that may have established themselves during the time the land was in sod, and also the many annuals that usually spring up from seeds buried in the soil, not having a chance to sprout while the land was in meadow or pasture.

Canada thistle and its seed—a perennial with a creeping rootstock.

Cereal crops, such as oats, barley and wheat, follow the corn and roots, and these are followed by clover and timothy. Where the rotation is a short one it is plain that weeds have no opportunity to establish themselves.

Destruction of Weeds before they ripen Seeds.—It is impossible to keep a farm entirely free from weeds, as there are many ways by which they may gain an entrance. As a rule, however, too little attention is given to the cutting of weeds in pastures, barnyards, farm-lanes and roadsides during the summer before they produce seed. A wise part of farm management is the fortnightly cutting of such weeds; it is time and labour well spent.

In this connection may be mentioned the value of spudding or hoeing weeds. When annuals and biennials are cut below the seed-leaves or the crown of the root the underground portion seldom sends out new shoots. However, with perennials with creeping rootstocks this treatment is not so effective.

Dandelion and its seed, a deeprooted perennial.

Clean Cultivation. In addition to what has been said about clean cultivation under *Crop Rotation,* emphasis may be laid on the practice of destroying weeds while they are small or in the seedling stage. A stroke of the harrow or the “weeder” just as the crops are nicely above ground will destroy a large number of seedling weeds. Moreover, surface cultivation after harvest will destroy the seedling weeds that have sprung up from weed seeds that ripened and fell to the ground before harvest.

Sowing of Clean Seed. As we have already stated, weeds are readily introduced through the sowing of impure seed, and perhaps no other agency has been more responsible in this province for the spread of noxious weeds. The careful farmer, therefore, will certainly give attention to this matter, and buy only the purest seed on the market. Such seed is the cheapest in the long run. It is an easy thing to sow weed seeds, but it is a difficult and costly thing to get rid of the weeds that spring from them. The old saying “One year's seeding means seven years' weeding' is below rather than above the truth.

Manure free from Weed Seeds. It has been proved that weed seeds are frequently spread on land with the manure. While experiments go to show that most seeds are destroyed when they are located in the middle of fermenting manure or compost heaps, yet it seldom happens that all weed seeds thrown on the manure pile are exposed to the heat of fermentation. It is a common saying that “daisy hay makes daisy manure”. Where hay and other feed are badly infested with weeds the owner should compost thoroughly all his stable manure even at the risk of losing some of its fertilizing value through fermentation.

Sheep as Weed-destroyers. Good farmers everywhere attest the value of sheep as weed-destroyers. These animals have the habit of close-grazing not only grasses but weeds as well, so that, by

Sheep-sorrel, a creeping perennial in acid soil.

destroying the leaves, they play the part of starving or smothering the weeds. In the great majority of farms the pasture lands are weedy, and as a result the weeds spread in time to other fields. If however, a flock of sheep were kept the weeds in the pastures would be readily controlled, and wool and mutton would be produced—a profitable way surely of fighting weeds.

Summary. It will be observed that the factors entering into any *general method of weed control* are identical with those discussed in Article I as the *causes of prevalence of weeds.*

W. L.

FARM LOSSES

Poor Seed

ONLY nineteen out of one thousand Canadian farmers visited last year by the representatives of the Commission of Conservation were found to be following a systematic selection of seed grain.

An alarming state of affairs is disclosed, when investigation demonstrates that less than two per cent of the farmers visited follow a systematic selection of seed similar to that followed by members of the Canadian Seed Growers' Association. It is true that quite a number keep the best part or parts of their fields for seed but, in Prince Edward Island, less than one-third of the farms visited do even this and only fifty per cent claim to do it on the two hundred farms visited in Ontario. In Nova Scotia, forty per cent of the farmers and, in Quebec, thirty-one per cent, bought their seed grain. Too often this purchased seed is only feed grain shipped in from the west and sold as seed. Frequently it contains foul weed seeds and, when, as in Nova Scotia, only sixty-four per cent of the farmers claimed to clean their grain in any manner whatever, these weeds are introduced to the farms. The western oats are sometimes frosted, and, as the farmer does not test for germinating power, a poor and thin stand often results.

The purchasing of seed often brings in new and unsuitable varieties. In one district in New Brunswick, seventeen varieties were found on forty farms and, in one district in Ontario, there were nineteen varieties on fifty farms. The farmer will buy these new varieties without knowing their strength of straw, susceptibility to disease or general suitability to his district.

Seed selection is not costly. If the farmer will save the best portion of his crop and then thoroughly clean that portion, by running it several times through the fanning mill, he will not find it necessary to pay out money for seed no better than, and often not so good as, his own, well cleaned. In many tests on the Illustration Farms of the Commission, it has been clearly demonstrated that it pays to sow good seed. In the case of clover, the crops from home-grown seed have proved, in nearly every instance, to surpass those produced from purchased seed. In many districts where farmers think clover and grass seeds can not be grown, it has been proven that these seeds can be successfully produced. They are often found growing to perfection on roadsides and in fence corners, which goes to show that, with care, they will grow in the fields.

During the winter months is the time to prepare the seed grain for the spring sowing. Clean out all the weed seeds and poor and shrunken kernels so that the good grain will have a chance to do its best. The question of the quality of seed a farmer shall sow is largely in his own hands. It rests with him whether it shall be clean or dirty, good or poor. *Good* and *clean* seed will *pay.—Conservation.*

A CONCRETE WATER TANK

Editor, Journal of Agriculture,—

QUESTION.—I wish to build a 40 barrel concrete tank on a small hill back of my buildings. Will you please tell me the length, width, height and thickness I should make it, also the quantity of stone, sand and cement needed.

W. B. R.

Answer.—Concrete tank to be 8 ft. long, 7 ft. wide and 4½ ft. deep—Thickness of wall to be 6 inches, bottom 6 inches thick.

You will require for this tank 4 cu. yds, crushed stone, 3½ cu. yds. sand, and 35 bags cement, (Sand must be free from loamy substance). To mix concrete: take 4 parts stone, 3 parts sand, 1 part cement.

After you have finished the walls—about two days—remove the inside forms; put in the floor and plaster well, about ½ in. thick, the whole interior of the tank with cement mortar.

Mortar mixed *one* part sand, one part cement; *Wet* surface before applying mortar.

C. J. LYNDE

THE MAKING OF MORTAR

Editor, Journal of Agriculture,—

QUESTION.—Will you please tell me how mortar is mixed for plastering over lath. Is it better to use two coats or just one? Why is hair used in the mortar?

G. A. B.

Answer.—If stone lime is to be used, take a water-tight box and put in lime, adding 3 lbs. hair for each bushel of lime—Pour on water to slack the lime, keep well stirred and add water until lime is all slacked; then add 3 bushels of sand to 1 bushel of lime; Mix well and run the mixture out into a large bin and let stand at least 3 weeks before using.

I would advise using some of the ready prepared mortars, as there are a number of different kinds on the market and they are, I think, quite as economical, I can recommend Rock Wall,—Proportions:—1 part Rock Wall, 2 parts sand; Mix well and wet sufficient to use. Do not prepare more than one bag at a time as it will get too hard before you can use it.

It is better to use two coats of mortar.

Hair is used in mortar as a bond.

C. J. LYNDE

THE CONSTRUCTION OF AN ICE HOUSE

Editor, Journal of Agriculture,—

QUESTION.—I plan to put up an ice house to hold 20 tons of ice. It will be a frame house. Please tell me what size to make it and how to build it.

R. P. S.

Answer.—To build ice-house: (a) build concrete foundation 8 inches high and 8 inches thick; (b) build it 10 ft. x 10 ft. x 8 ft. with a peak roof; the sleepers should be 4 inches x 6 inches; studding 2 inches x 4 inches and 2 inches centres; (c) board inside and out with T & G lumber (this leaves good dead air space). Leave opening in each gable for ventilation. Make door in the end of the ice-house and put boards on inside of opening so that they may be taken out as ice is used down.

C. J. LYNDE

SHINGLES

Editor, Journal of Agriculture,—

QUESTION.—What is meant by one thousand shingles? How much roof space will 1000 shingles cover?

G. M. S.

Answer. — 1000 shingles laid 5 inches to the weather will cover *one square,* which is 100 sq. feet. (All roofing material sold by *one square* covers 100 sq. ft. of surface).

C. J. LYNDE

PROTECTING FARM IMPLEMENTS FROM RUST

A correspondent of the "Breeders' Gazette" gives this advice on this subject:

Housing fails because it does not keep the moisture-laden atmosphere from contact with the surface of the steel. There are many cheap gummy or oily substances that will protect a bright plough or hoe or other farm tool. I have found heavy unrefined oil effective and easily applied. Axle grease is used so generally for waggons that many farmers apply that. It is more expensive and more difficult to spread so as to cover the entire surface of the tool. Unrefined cottonseed oil and low-grade castor oil spread readily and carry gum and oil enough to dry slowly and cover well, and they do not dry so hard as linseed oil, which prevents the plough or hoe from scouring readily.

A barrel of heavy lubricating oil on the farm will save any further outlay for axle grease or machine oil. It is good for killing vermin on animals and for protecting tools from rust—if only we get the men to apply it.

THE FARMER'S ICE HARVEST

The Benefits to be Derived From an Ice Supply—Ice House and Dairy Plans

ONE of the natural resources of Canada, and one which is of great benefit to humanity, is the annual ice crop. While in towns and cities almost universal advantage is taken of the ice supply, such is not the case with farmers.

A good supply of ice is more important in the country home than in the city home. People in the city can purchase perishable food supplies as needed, while, in the country, it is often necessary to use canned, corned or smoked meat products during the summer, when the table should be supplied with fresh meats. Ice could be used to preserve meat, butter, and other perishable products for the table. The production of high grade dairy products on the farm is almost impossible without ice. Many markets require that, before shipment, the milk be cooled to a degree attainable only with ice. There are many excellent and healthful dishes that might be prepared for the farm table if a supply of ice were at hand.

In many sections of the country, the luxury of an ice supply can be had for the gathering; the cost of harvesting and storing is small, compared with the utility.

Farmers in the neighbourhood of summer resorts may, with considerable profit, undertake to supply ice to the residents during the summer months, or, when harvesting their own supplies, may fill private ice houses in the winter.

In selecting a stream or pond from which the supply is to be taken, care should be exercised to obtain ice free from contamination or pollution, and free from decaying vegetable matter. The latter is very objectionable because, as the ice melts, it will be left in the ice box, rendering it filthy and dangerous to health.

For the proper storing of ice several points must be carefully considered. (1) Expose as small a surface as possible to the air or to the packing material, that is, have the ice piled so as to form, as nearly as possible, a cube; for example, a mass of ice 12x12x12 feet exposes less surface than the same tonnage piled so as to cover a larger area. (2) Good insulation is necessary; that is, the ice should be protected from external influences such as heat and air. (3) There should be good drainage because the lack of it interferes with insulation. (4) The ice should be packed so as to prevent the circulation of air through the mass.

The more solid the mass of ice can be made, the better will it be preserved. An expensive structure is unnecessary for the purpose of storing the ice crop. The accompanying illustrations show the construction of a simple ice house, as also a combination of ice house and refrigerator room. These are very simple and may be erected by any farmer.

On many farms, there are places in the buildings which could be used for storing ice. A silo which has been emptied by February might be used. Ice can usually be stored at a time of the year when there is little other pressing work on the farm. Now is the time to prepare for laying in a supply of ice for use in the hot season of the year.—F.C.N. in *Conservation.*

HARVESTING THE ICE CROP

Co-operation Among Farmers an Economical Advantage in this Work

THERE are few localities in Canada that have not available a river or smaller stream from which a supply of ice may be obtained for use during the summer months. The ease with which the ice crop may be secured is probably the reason why it is not taken advantage of to a greater extent than at present. For economical harvesting operations it is advisable that a number of the farmers of a community co-operate, sharing the expense, and making the labour proportionately lighter.

A few tools are necessary to harvest the ice supply efficiently. A steel scraper to remove the snow covering is desirable; some styles of road scarpers may be used, or a very good homemade scraper may be made of wood and faced with a strip of steel. An ice plough facilitates the work of scoring into blocks for breaking off. A slice bar for breaking off the blocks can be made similar to a crowbar, with a sharp blade from six to eight inches wide. An ice saw may be improvised by removing one handle of a cross-cut saw. A number of pike poles, ice tongs and a chain, with heavy pair of ice tongs attached, complete the tools required. A platform, one end of which may be let down into the water, and the other end raised level with the floor of the sleigh, permits the use of a horse in taking the ice out of the water and loading on the sleigh.

The ice should be packed as solidly as possible in the ice house and care taken to have sufficient insulating material around the outside and on top. If more ice is required than can be accommodated in the ice house, it may be piled outside, first laying boards on the ground, and covering them with a layer of sawdust or straw. The sides and top should also be well covered and protected with boards to prevent the wind carrying away the insulating material. Sorted in this way the ice will keep till well into the summer.—*Conservation.*

SEEDS WEEDS AND FEEDS

Items of useful information, from the Seed Branch, Ottawa

BULLETIN No. S-8 of the Seed Branch, Dominion Department of Agriculture, is now in press and will soon be available for distribution through the Publications Branch, Ottawa. It is published to meet the great demand for "Farm Weeds" which was revised and enlarged in 1909. This further revision and extension contains 180 odd half-tone illustrations of weeds and weed seeds. Among other matters it treats of the condition of seed grain actually used by Canadian farmers and the distribution of weed seeds by ommercial feed grain, mill feeds and screenings from terminal elevators.

SOWING WEEDS IN SEED GRAIN

In the spring of 1913 officers of the Seed Branch took samples, representing as accurately as possible the average seed used in the districts visited, from over 2000 farmers throughout Canada. 978 samples of oats were analysed at the Ottawa Seed Laboratory and 547 of these, or 56 per cent, contained an average of 76 noxious weed seeds per pound, the highest number being 4,838 in the pound. 860 or 88% of the samples contained an average of 239 of other weed seeds, the highest number being 6,954 per pound. With this weed seed content and the rate of seeding reported an average of 6,400 noxious and 20,800 other sorts of weed seeds would be seeded on each acre of land in oats. Barley and wheat showed similar results. Some of these weed seeds are difficult to clean out, but most of them can be separated by a fanning mill properly equipped and well operated.

WEED DISTRIBUTION BY FEED GRAIN

Ordinary commercial grades of grain coming out of terminal elevators are foul with weed seeds. Analysis of five samples of No. 2 Canada Western oats taken from as many terminal elevators showed 313 noxious weed seeds per pound and a much larger number of other weed seeds. In transportation some of these are distributed along the railroad and introduced into new localities. Many wild oats and mustards fed in uncrushed oats to horses will live and pollute farm lands. Others become mixed with the manure in handling dirty grain and other feeds. Such feeds should be thoroughly ground, and weedy manure should be heated or rotted in order to destroy the vitality of weed seeds.

THE TURNIP SEED SITUATION

TURNIPS and other roots occupied 175,000 acres in Canada in 1914 and yielded 69,003,000 bus. valued at $18,934,000. Turnip seed was imported into Canada for the year ended March 31, 1914 as follows:

From—	Quantity, lbs.	Value.
United Kingdom	1,123,958	$95,471
United States	62,818	5,023
France	126,687	10,454
Holland	224,162	16,855
Other countries	39,698	3,071
Total	1,577,323	$130,874

There is good reason to believe that a part of the turnip seed coming to Canada from the United Kingdom had been grown under contract on the continent. The prospective scarcity of labor and the need for food production leaves open to speculation the proportion of seed supplies available from Europe for use in Canada in 1916.

SOW THE BEST VARIETY

The 1913 investigation into the condition of seed grain and flax actually being used on Canadian farms showed that the variety name of 34 per cent of the 2065 samples taken was not known by the farmers. Varieties of cereal crops differ in time of maturity, strength of straw, freedom from disease, yield, per cent of hull in oats and hardness in wheats. The three highest yields of oats obtained at each Dominion Experiment Station in 1912 averaged 33½ bus. more per acre than the three lowest. Experiments have shown that four or five varieties of oats cover all the conditions of Canada, yet forty farmers in one district were found growing seventeen different varieties. Each district should grow only the variety of crop best suited to soil, climate and markets. The variety might be chosen on the advice of the nearest Experiment Station.

ELEVATOR SCREENINGS AS A FEED

Screenings from the terminal elevators at Fort William and Port Arthur are composed of shrunken and broken kernels of wheat, oats, barley and flax with a varying proportion of different kinds of weed seeds. An eighth ounce of screenings which had been ground as chopped feed was found to contain 233 noxious and 284 other weed seeds. But when the smaller weed seeds have been removed it is not difficult to destroy by grinding the vitality of nearly all those remaning. The smaller weed seeds, comprising from 20 to 40% of the whole, are not completely ground by ordinary mills and some of them are believed to be decidedly unwholesome. When graded to remove these smaller harmful seeds and the balance finely ground, screenings make a cheap and nutritious stock feed.

WEED SEEDS IN FEEDING STUFFS

Bran, shorts and chop feeds are sometimes contaminated by ground screenings which are mixed with them in some of the flour mills. Of 396 samples collected throughout Canada in 1913 by the Inland Revenue Department, 140 contained an average of 57 noxious weed seeds per pound, and only 144 of the samples were entirely free from vital weed seeds. One sample of chopped feed contained 1104 noxious weed seeds per pound. Bulletin No. 254 of the Inland Revenue Department gives the names and addresses of the manufacturers and the quality of their mill feeds.

SEED BRANCH, Ottawa

LIVE STOCK

CONSERVE THE BREEDING STOCK

EVERYONE knows that trade conditions and commercial enterprise have suffered a very serious and unexpected upheaval during the past year. To this situation the war has, of course, largely contributed; but other causes, including the general financial depression throughout the country, have been operative for some months past. The agricultural industry has, naturally, been very widely affected by these changing conditions and by the varying situation with respect to demand and supply. The rise in the price of grain, together with the corresponding fillip to grain production, represents, without doubt, the most outstanding feature of the direction which has been given to agricultural activity.

We need, perhaps above all things else, sane, level judgment in the conduct of our agricultural affairs during the coming year. It is to be expected that grain production will be largely increased. The raw products of the soil are, and will be, in demand at remunerative prices. What then is to be said, what course is to be followed, with respect to the breeding of live stock?

The high price of feed, on the one hand, and relatively low prices for market stock, on the other, have resulted in very heavy marketing throughout Canada, particularly in the Western Provinces, of the stock, suitable for breeding purposes. Perhaps this was inevitable, but will these conditions continue? Feed grain will, without doubt, be high in price, but it must never be overlooked that the country can maintain very large numbers of live stock on the enormous quantity of rough fodder which it can produce. To waste this, for the sake of the grain which can be grown, would, under the present circumstance, be criminal neglect. It is clear, then, that the country should conserve its breeding stock. If grain is to be grown for sale it is recommended that plans should be carefully thought out as to the manner in which the greatest quantity of rough fodder may become available for feeding purposes and as to the means by which this otherwise waste product, together with the screenings and unsaleable grain, may be utilized to the best possible advantage. In other words eliminate waste. Do it by feeding live stock.

The present low prices for stock cannot last long. A careful review of the world situation makes it clear that there will be a shortage next year. Europe is becoming seriously depleted in both breeding and feeding stock. The United States, for ten months of the current year, at its leading markets is short 746,045 cattle, 208,000 sheep and 1,894,939 hogs. Canada has, as before stated, heavily liquidated her breeding animals and, while it may possibly maintain its quota next year of cattle and sheep, it is doubtful if more than seventy-five per cent of the number of hogs will find their way to market in 1915, as compared with the current year. It is, therefore, a time for live stock men to stay with their trade. The present tendency is, of course, all the other way. A safe harvest is likely to be reaped by those who have stock for sale next year. Even bankers and business men are of this opinion.

One word of advice is to be given. Avoid marketing so far as it is at all possible to do so during the period of October fifteenth to December fifteenth. This is a time of the year when everybody else has stock for sale. It is a period when packers know that they can fill their cellars with cheap meat. These are the months when the surplus of the whole country finds its way to the packing centres. It is invariably the period of low prices, uncertain markets and disappointing returns to the producers. Breed, therefore, to have your stock available for sale at some other time of the year. Take care to provide sufficient winter feed that you may not be forced to sell when the cold weather comes. Above all, conserve your breeding stock.

Circular Letter, Live Stock Branch, Ottawa

FEDERAL ASSISTANCE TO HORSE BREEDING

THE progress that has been attained in the past in Canadian horse breeding has been due largely to individual effort. To the few who have done so much for the advancement of the industry every credit is due. Through the lack, however, of concerted action and co-operative measures on a large scale amongst the breeders, the business has not progressed as rapidly as could be desired.

The want of proper organization, except in the more favoured districts, has prevented the farmers generally from securing and retaining the services of good breeding sires. In a majority of sections, breeders wishing to grade up their horses are forced to use whatever stallions may, by chance stand for service in their district. Many of these are faulty in conformation and lack in quality, while others, though of better type, remain, either through insufficient patronage or because of failure to leave colts, but a single season in each district. The fact also that there has been no systematic adherence to the use of one breed suggests another reason for the lack of progress in the breeding of high-class animals.

It must be recognized, further, that the owner of a valuable horse, after paying for maintenance, insurance, interest on investment and the expense entailed in the collection of his fees, has frequently little left from his outlay, particularly in districts where he has to compete with grade and scrub stallions standing for service at a very low fee. As a result, really high-class stallions can be maintained only in districts where the breeding of horses has been given serious and progressive attention.

In view of these considerations, the Minister of Agriculture proposes to enter upon a policy which may serve to place the horse breeding industry in Canada in a position comparable to that which it has attained in Great Britain and other European countries. It is believed that by encouraging the organization of breeders' clubs and by enabling such clubs to procure the services of good breeding stallions under favourable financial conditions, the assistance in this direction can best be provided. The encouragement of community breeding will, maturally, of itself, be productive of useful results. The payment to community organizations of a part of the service fee will, it is expected, give a permanent stimulus to the hiring of the best stallions that may be procured and, at the same time, promote the development of a comprehensive movement in the interests of this important national industry.

Stated briefly, the scheme is as follows:—The farmers of any district, wishing to work for the betterment of horse breeding, by encouraging the use of sound, individually excellent pure bred sires may form a Breeders' Club for the purpose of hiring a pure bred stallion for the benefit of the members. These Breeders' Clubs, by organizing under and adopting the constitution and by-laws and conforming to the various rules and regulations governing this grant may participate in the Federal Assistance given to such Clubs. This consists in paying practically 25% of the service fees on a guaranteed number of mares.

THE EXCEPTION

With a view to encourage the breeding of Remounts, the portion paid by the Live Stock Branch to Club's hiring suitable Thoroughbred stallions shall be 40% on all mares except Thoroughbred mares.

For the booklet on federal assistance and all other information address the Dominion Live Stock Commissioner, Ottawa, Canada.

CANADIAN AYRSHIRE BREEDERS' ASSOCIATION

Annual Meeting

THE Annual Meeting of the Canadian Ayrshire Breeders' Association will be held in the Monument National, 296 St. Lawrence Boulevard, Montreal, Que., on WEDNESDAY, FEBRUARY 10th, 1915 at 10 a.m., to receive the reports of officers and committees, for the election of Directors, the transaction of new or any business that may legitimately be brought before the meeting.

All persons interested in the breeding of Ayrshire cattle are invited to attend this meeting.

The Directors will meet in the Queen's Hotel, on Tuesday, February 9th, at 1.30 p.m.

All members in good standing whose annual fee is paid to, and including 1915, are entitled to vote at this meeting. The annual members' fees of $2.00 is due January 1st of each year, and is PAYABLE TO THE ACCOUNTANT, NATIONAL LIVE STOCK RECORDS, DEPARTMENT OF AGRICULTURE, OTTAWA, ONT.

A banquet will be held in the Queen's Hotel on the evening of February 10th, at 6.30 p.m.

An invitation has been received from Dr. F. C. Harrison, Principal of Macdonald College, to visit that splendid educational institution and inspect the fine herd of Ayrshires kept there, on Thursday, February 11th. Invitations have also been received from breeders of Ayrshires in the vicinity of St. Anne de Bellevue, and from Sir H. Montagu Allan at Beaconsfield to visit and inspect their herds.

Arrangements will be made for this outing and an announcement will be made at the meeting as to train service to St. Anne's and Beaconsfield.

Arrangements have been made with the Eastern Canadian Passenger Association to secure convention rates. These rates apply on all railways operating in Canada, east of Fort William, Ont.

Members will please purchase single first-class fare tickets to Montreal, securing a Standard Convention Certificate, which certificate must be signed by the Secretary, and vised by an officer of the Eastern Canadian Passenger Association, upon payment of 25c. If a sufficient number are in attendance return tickets will be issued free.

N.B.—Please observe this travelling arrangement.

We look forward to a large attendance, and an interesting and profitable meeting.

Come if possible, and bring a friend with you.

W. F. STEPHEN,

Sec.-Treasurer

Huntingdon, Que., Jan. 4th, 1915.

ANNUAL MEETING OF THE QUEBEC GENERAL STOCK BREEDERS' ASSOCIATION

THE general annual meeting of the GENERAL STOCK BREEDERS' ASSOCIATION of the province of Quebec will be held at the QUEEN'S HOTEL, Montreal, on Tuesday the ninth of February next, at 10 a. m.

There will be three sittings: 10 a.m., 2 p.m. and 7 p.m. The honorable ministers of agriculture of Quebec and Ottawa will be present at the afternoon sitting.

Members are requested, on their arrival, to give their names to the Secretary who will supply them with the Society's badge. All members present at the meeting are cordially invited to take lunch at the QUEEN'S HOTEL, at the Society's expense. Their badge will give them admission to the lunch room.

J.-A. COUTURE, Secretary,
Quebec

RAILWAY REDUCED RATES

Those attending the meeting should purchase one-way first class tickets, and secure from the agent at starting point, a *Standard Convention Railway Certificate*, which will, on payment of 25 cents at Montreal, enable the holder to return free or at reduced rate. These rates are good going February 7 to 13th inclusive, return limit February, 17th.

PROGRESS IN COW TESTING

By Chas. F. Whitley, Dairy Division, Ottawa

(An Address given at the recent Eastern Ontario Dairy Convention in Peterboro.)

IF we may assume that cow testing is of some value to dairymen, we may hope to find some evidences of progress. A hasty sketch of two or three results may therefore be of interest.

One evidence of recent progress in cow testing is the marked increase of interest taken in it by the average dairy farmer, interest real and widespread. Requests for information on the subject and for record forms come by almost every mail from all provinces. One demand for a further supply contains this typical statement. "I would not like to stop weighing. It is a surprising check on the feeding and working condition of the individual cow". That man weighs every milking.

A second evidence is the decided influence cow testing has had on general public sentiment. Occasional discussions on it are overheard amongst non-dairymen in public places, frequently with this commentary, "What a simple and sensible proposition!" It is not regarded as a freakish experiment. Indeed cow-testing has proved itself a vital necessity to the progress of the true dairyman. Invisibly banded and corded together as such good men are now, the time seems almost ripe for a membership badge or a club button as a distinguishing mark of honour for these leaders, real benefactors of their communities.

Then the solid and substantial improvements made on dairy farms belonging to this progress club of cow testers constitute even to the most casual observer a third strong evidence.

Where do you note the abundant forage crop, the improved stables, the windmills, the new silo, etc, etc? On the very farms whose owners use milk records. Local tradesmen and machinery agents have that fact sized up, and to those particular farms stream through the local dealers the labour-saving implements, the good piano, the new dresses, the inside plumbing and lighting systems for the deserving partners in the home. Cow testing helps along "business as usual"; it rests not there, but always in the van of progress issues a summons to every devotee for "better business than ever".

Turning now to the personal equation, we find in the large crop of benefit reaped by the farmer himself a fourth evidence of such improvement made in the ordinary dairy herd that registers on the luminous dial of progress not merely present gain but a forecast of future greatness. We find, for example, that the standard of production is being steadily advanced, men now talk freely of 7,000 and 8,000 pounds of milk as a herd average, and that type of owner aims even higher, while the type formerly content with 4,000 pounds per cow has mounted a few solid rungs up the ladder of progress. We find also amongst our cow-testing members dairy herds with less indiscriminate mixing of grades of three or more breeds, herds where the proportion of low testing cows is decreasing, and herds that are of far more even production (where the lowest yield any one month is 730 pounds of milk and 23 pounds of fat) because dairy records have helped in selection.

So the educational features of this movement are of decided importance.

It means to any herd owner far greater efficiency than he now has, because while one score that counts is "more milk" the bull's eye aim is "more economical production by each cow in the herd". The successful shot on this target is dependent not only on a strong faith in the permanence of the dairy business, but also on having a thoroughly reliable and up-to-date equipment of cows busy behind each manger. In that aim cow testing has abundantly proved itself, whereever intelligently used, an indispensable range finder.

While we entertain unbounded admiration for the good dairy cow as an economical producer of delicious food for mankind from the coarsest of feed, yet we can only stand aghast at the large room there is for general improvement. Taking a survey of 650 herds in our five eastern provinces, I contrasted the best cow in each herd with a poor one, the lowest yield but one, and obtained this result; valuing fat at 30c. per pound and allowing $35.00 as the average cost of feed, each one of the best cows gave as much profit above that feed cost as was made by *fifteen* cows of the poorest type. This comparison of 1,300 representative cows surely points out one great want, a better supervision and direction of willing, but at present quite erratic, cow energy is urgently needed on many a farm to-day; with 15 to 1 the odds are altogether too unequal. In this great cow game, duly indexed on fateful cards, what hand do you hold? Have you four dairy queens, a royal flush, or some mean little two spots?

It is the outstanding privilege, more, the bounden duty, of every dairyman to move the pointer on his own pressure gauge of efficiency. Cow testing is good insurance against losses, and builds a solid concrete dam against the deceptive leaks caused by those poor cows that dribble only a meagre 125 or 130 pounds of fat in a season. We need to replace that too costly kind, that deciduous cow shedding her leaves too early in the fall, by the economical almost evergreen type that in an honest season's work cheerfully gives 280 or 300 pounds of fat. To weigh and sample is but a trifle, a matter of only half a minute; from that tiny seed act climbs the sturdy plant of knowledge up the trellis of your perseverance and intelligence, finding full fruition in cows that pay well.

Do you say it is too niggling a job? May I venture to remind you that lack of detail is the sombre headline in many historical chapters of failure. The master of detail is a precise, punctual man, a sure winner. The small detail of weighing is well worth looking after. Your fellow dairymen bid me convey this message: "It pays".

It is desired to lay emphasis on testing as well as weighing because it becomes daily of more importance. You may have noticed that since 1911 the value of Ontario butter has increased by one and a half millions of dollars, while the value of cheese made in Ontario has decreased by a similar sum. Then, to every dairyman but especially to a creamery patron, it is a matter of some moment whether a cow tests 3.4 or 4.3; whether she falls perhaps 10 or 18 pounds of fat in a month below the yield of a stable mate on the same feed. How should we know of these good grade cows, cows giving 50, 60 and 70 pounds of fat per month, if we did not have dairy records? The modern slogan "Safety first" may well be heeded by the modern dairyman. To him it is translated perhaps better by "Quality first", that is, such cow quality as, on the indisputable evidence of dairy records, produces abundant milk and fat at moderate cost.

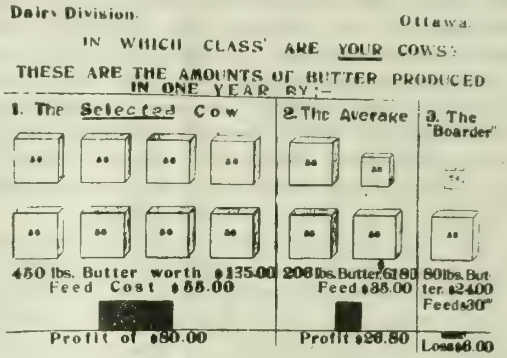


CHART I

This chart gives as a diagram the comparative yield in boxes of butter of three types of cows. The first, selected, both fed and bred for production, is a five-year-old grade that gave 11,630 pounds of milk, 450 pounds of butter worth $135.00; with feed cost of $55.00 her clear profit is $80.00. Such cows and better ones have been discovered through cow testing. Her owner was not content with an ordinary type, an average cow, for satisfaction of that kind effectually kills and buries all progress, so he selected, using records as a rational basis. The second is the average yield of 8,200 cows as collected by our recorders at 13 dairy record centres in Ontario, Quebec and Prince Edward Island, namely 206 pounds of butter worth $61.80, feed cost $35.00, profit $26.80. This is probably much better than the average yield of all cows in the Dominion. The third is the type unmasked by cow testing, desired by no one. In this case it is not just one lone individual cow but is the average yield of a herd of ten cows in Ontario, 80 pounds of butter worth $24.00, and the owner estimated it cost $30.00 to feed each cow.

Does this comparison not convey something to you? Is it not worth a very great deal to you to look carefully into this matter of cow testing, to think in larger figures, to determine that your herd shall speedily be one of selected individuals? The best in everything is yet ahead of us; the best cow is yet to be recorded, helped on by the best in methods, the best in crops, the best in dairy farming generally, so that our dairy herds, uniformly excellent, may be of the finest type possible, always improving. Join this society of unlimited possibilities, becomes a member to-day, start recording at once.

Cow testing has always sounded one dominant note, the selection, on their records, of the best cows. The recommendation is timely in view of the claim that there is an investment by dairymen of from $500 to $1,000, or more, for every gallon of milk produced per day. Thus the efficiency of every cow is no slight consideration in our huge business of milk manufacture. For every hundred dollars invested in the manufacturing industries of Canada there is reported to be a gross return of ninety-three dollars; in agriculture there appears to be a gross return of seventeen dollars. Can we do better? Dairy records, through giving what is absolutely essential to every manufacturer, a knowledge of cost of production, have paved for many men the royal road to larger returns; the successful business dairymen to-day make each cow they own stand her trial by the impartial jury of scales, test and record form. The sentence is soon passed, and several reformatory inmates now pay good dividends.

A fifth evidence is found in the largely enhanced profits and increased yields of milk and fat obtained by those well-informed men who persevere in acquiring knowledge charted in their own stables on the record form. The unit, whether cow or acre, is being studied and developed as never before because of dairy records. Cow testing is not hedged about by any trade secrets or any copyrights formula. No red tape binds one in making his own simple totals. There is no selfish or sinister competition; but, on the contrary, there is the greatness of true co-operation in securing results that count very materially in building a better home-farm, supporting loyally the near-by factory, advertising the locality as a good dairy section, while adding in no small measure to that needed efficiency which makes true prosperity for the Empire.

Scattered all over, we find instances like this, the man who has been cow testing now milks eight cows and gets $400 or $430 more cash than the man who does not weigh and sample, but who contentedly or discontentedly fusses round with eleven unselected milkers.

This grand old province of Ontario could be getting at least another twelve million dollars income from the cows now milking, and when cow testing is still better appreciated, she *will* obtain that sum.

Canada expects every cow to do her duty: "What we have" in the way of good cows, "we'll hold": What we have not, let us see that we get, and we'll get them because cow testing clearly points the true path of progress.

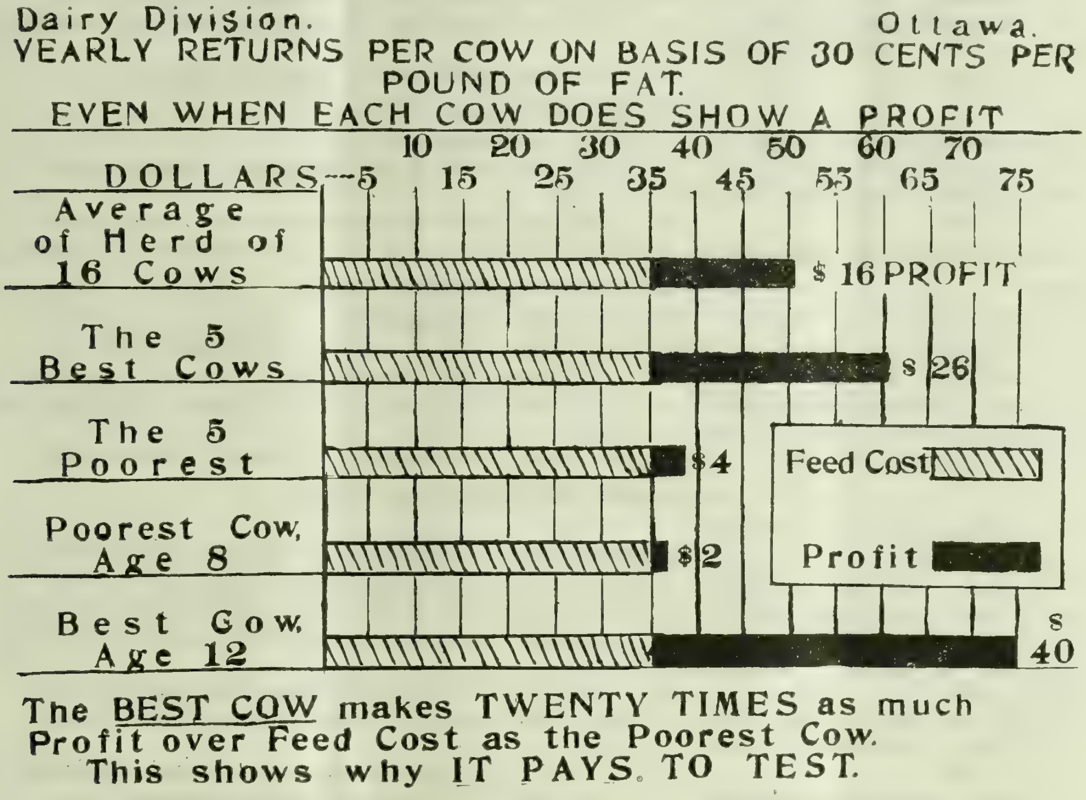


CHART II

This chart indicates graphically the yearly returns from a herd of 16 cows where some selection has been practiced and all cows put on a paying basis.

With an average yield of 4,850 pounds of milk, 3.5 test and 170 pounds of fat, with feed valued at $35.00 per cow, there is a clear average profit of $16.00. But it will be seen that the five best cows yielding 204 pounds of fat make $26.00 profit as against the $4.00 average from the five poorest. Then on comparing the worth of the poorest cow, age 8, giving only 122 pounds of fat with the 12-year-old giving 247 pounds of fat, we see clearly that it is not a question of one cow returning just twice as much profit because she gives twice as much fat, but the profit is actually *twenty times* as great.

May I venture to submit that clearer proof could not be wanted of the practical utility of dairy records.

What additional sum is within our reach as direct gain from cow testing? Considerable light is shed by the fact that in one creamery in Prince Edward Island over thirty patrons, members of our cow testing association there, took in double the amount of money per cow last year that they did four years ago, while the other patrons show little or no increase. So it is in many other districts. There is nothing to prevent any factory of 500 cows, if its patrons take up cow testing in earnest, handling extra money annually to the extent of $8,000. We have men by the score in Ontario and Quebec now obtaining 1,000 and 1,500 pounds of milk more per cow than two years ago.

SWINE

WITH the desire of placing an up-to-date handbook on swine raising within the reach of every farmer in the province, the Ontario Department of Agriculture requested Prof. G. E. Day, of the Agricultural College, Guelph, one of Canada's leading authorities on live stock, to prepare such a work, which has been issued in the form of Bulletin No. 225, entitled "Swine", containing eighty pages, profusely illustrated.

It is a most practical and complete statement, covering every point helpful in the selection, housing, feeding, and general handling of the bacon hog. The bulletin opens with the place of the pig on the farm, Prof. Day very plainly showing the Why as well as the How. The various types of swine are then described, with photo-engravings of prize-winners at some of the leading live stock shows.

The author goes fully into methods of feeding, prescribes the best rations, gives the causes of soft bacon, and shows how to avoid that and other drawbacks to a perfect carcass. His hints on pasturing and soiling crops in hog-raising, especially where he compares rape with clover and alfalfa, are particularly suggestive. He also gives valuable directions as to the feeding of roots, potatoes, pumpkins, apples, and dairy products.

Prof. Day places great emphasis on the selection of both sire and dam, and his counsel in this regard is much needed. Every feature pertaining to mating is thoroughly dealt with, the description of the breeding pen being especially helpful. The management of the sow during and after gestation is thoroughly handled, and will likely save many a litter to the swine-raiser who will read this bulletin.

The advice on raising young pigs is intensely practical. Hints on dealing with rupture and other troubles are also given, together with excellent counsel regarding exercise.

The chapter dealing with the curing of pork is worth much to those who put up their own meat. An excellent method of try out lard is also described.

Prof. Day bestows much attention upon the question of buildings, and gives plans of both stationary and portable pens that he can heartily recommend. He also pays considerable heed to sanitation, giving the latest suggestions regarding disinfection, ventilation, etc.

A valuable chapter is that devoted to the common diseases of swine. Many of these are described, and their treatment is covered in so full and practical a manner as to make every hog-raiser practically his own veterinary.

Any farmer desiring a copy of this latest bulletin on "Swine" will receive one free by writing the Department of Agriculture, Toronto. —*Weekly Sun.*

RATIONS FED BY OHIO AND WISCONSIN DAIRYMEN

THE following rations, given in a little pamphlet entitled "Facts and Helps in Dairying", issued by the Ohio State University, are interesting, as showing how expert dairymen in Ohio and Wisconsin feed their cows when they wish to make money:

W. J. Gillette, Wisconsin: Winter ration—Oats, bran and gluten feed mixed one-third each by weight; about fifteen pounds per cow; about forty pounds of silage, and all the clover hay they will eat. Summer ration—Pasture; mixed grasses; two parts bran, one part corn meal; from two to ten pounds per cow per day, depending on flow; about six pounds silage. This is one of the best Holstein herds in America. During the summer of 1906 fourteen of nineteen cows had to be milked three times a day. The world's record cow is in this herd.

Winters Bros., Ohio: Winter ration—Equal parts of bran, ground oats and corn; one-sixth of the above in weight of oil meal; all the silage they will clean up. This herd averaged 400 pounds of butter-fat in a year per cow, a few years ago. The cream was sold to a creamery.

Emmet Philbrook, Ohio: Winter ration—Four pounds bran; two pounds old process oil meal; about forty pounds silage; plenty of hay. Summer ration—Pasture; four pounds of bran. This herd of grade Jerseys showed good care, and was giving good returns. The cream was sold to a creamery.

McCreary & Son, Ohio: Winter ration—About forty pounds silage; two pounds oil meal; two pounds bran; four pounds ground corn and barley, one-half each. Summer ration—One pound hominy chop; two pounds bran. A few years ago they fed the following winter ration: Two pounds gluten feed; two pounds bran; two pounds ground oats; four pounds malt sprouts; about forty pounds of silage. This herd of over 200 grade Jerseys produces over 300 pounds of butter-fat per cow per year. The milk is sold to a creamery.

Ex-Governor Hoard, of Wisconsin: Winter ration, at one time—Thirty-five pounds silage; ten to twelve pounds alfalfa; three pounds bran; two pounds ground barley.

Hartman Stock Farm Dairy, Ohio: Plenty of silage; 300 pounds gluten; 100 pounds middlings; 100 pounds of bran; 60 pounds of ground oats; 50 pounds of corn meal; 300 pounds cut hay (clover or alfalfa). Cows giving from 30 to 35 pounds of milk per day receive 15 pounds of the above ration.

It will be noticed that in none of these rations is corn meal fed in large amounts. The corn crop appears, however, in every ration, in an abundance of silage. Bran, although it is an expensive source of protein, is fed in every ration.

THE PLACE FOR SILAGE

Does Not Contain Enough Flesh Forming Substance—Best Suited to the Needs of the Dairy Cow

HORSES have their limitations. The roadster is limited in one direction, and the draft horse in another. So with all kinds of cattle. In fact, limitation is the law of manure both in men and animals and plants.

Silage is one of the best feeds in the world, but it has its limitations. The trouble is that when it is first introduced, farmers are likely to overestimate it, not recognizing the limitations.

To begin with, silage made of corn (and that and sorghum are about the only crops that it would pay in this country to put in the silo) can have no greater feed value than was in the forage when put into the silo. The silo will make it more palatable than dry corn fodder, may possibly make it more digestible; but it cannot put any more value into it. In fact, there is waste—considerable waste—the waste from heating, the waste from exposure on the surface, the waste from improper packing, and the waste from molds of various kinds. One of the limitations of corn silage is that it is not a perfectly balanced ration any more than is corn and corn fodder, or fodder corn. All of these contain too large a proportion of carbohydrates, and therefore must be balanced up by flesh formers.

Some of our readers are no doubt trying to fatten their cattle on corn silage, regarding it as grain feed. It was at first so regarded, but it is not. It is really roughage, the value of which depends largely on the amount of grain there is in the silage. It cannot be used in the later stages of feeding, because the steer cannot hold enough of it. Therefore, it must be supplemented with grain. Furthermore, the supplementary feed must tend to balance up the corn silage, so as to provide what the system of the animal to which it is fed demands. It is a splendid thing to commence fattening cattle with, but the finish must be made on some more concentrated feed.

Still less can it be used to fatten hogs. They do not have the capacious stomach nor the series of stomachs that the grazing animals have. For the same reason, while alfalfa is a fine thing to winter brood sows on, a good thing for pasture for pigs, and a good thing for winter forage for grown shotes, it is not the thing with which to make a finish.

Silage is not a good feed for horses, although a little of it may serve a good purpose. It is not a desirable thing to fatten sheep with, for the same reason that it is not desirable in excessive amounts for fattening cattle. A little of it for both, however, is excellent.

It does better with the dairy cow than with any other. She has the capacity, and milking makes a heavy draft on her system, which keeps her from getting fat. The dairy cow can easily handle thirty or forty pounds of silage a day; but don't undertake to get the best results from dairy cows by feeding them silage alone. It needs to be supplemented by some other feed which furnishes the missing elements. Don't undertake to balance up your silage with timothy hay or blue grass or wild prairie hay. They contain too much of the same elements that silage contains. Try it with alfalfa or with clover or with sweet clover or with cowpeas if you have them. If not, you had better get some cottonseed meal or oil meal. This will furnish the lacking elements and correct the limitations of the silage.—*Wallace's Farmer.*

OFFICIAL RECORDS OF HOLSTEIN - FRIESIAN COWS

From December 1st to December 31st, 1914

MATURE CLASS

No. and Name of Cow	AGE y.	m.	d.	Milk Lbs.	Fat Lbs.	Butter Lbs. 80% Fat.	OWNER
1—Miss La Honda 9682	6	11	2	688.8	22.25	27.81	Samuel Dickie, Central Onslow, N.S.
2—Sir Johanna's Burnside 6283.	9	0	1	499.3	20.45	25.57	Gordon H. Manhard, Vaudreuil, Que.
3—Allie DeKol Abbekerk 12758.	9	11	12	509.9	18.99	23.74	Herman Bollert, Tavistock, Ont.
4—Lady Colanthus DeKol 6451 .	9	1	27	614.2	18.39	22.99	John Steinacker, Stratford, Ont.
5—Queen of Oxford 6355	10	8	9	453.1	16.07	20.09	T. W. McQueen, Tillsonburg, Ont.
6—Princess Emery DeKol 6770 .	8	7	16	454.3	15.36	19.20	H. C. Holtby, Belmont, Ont.

SENIOR FOUR YEAR OLD CLASS

No. and Name of Cow	y.	m.	d.	Milk Lbs.	Fat Lbs.	Butter Lbs. 80% Fat.	OWNER
1—Homestead Pauline Colantha 14271	4	7	0	456.8	16.62	20.78	Laidlaw Bros., Alymer, Ont.
2—Lady Carmen Pontiac 13687 .	4	8	24	519.9	16.41	20.51	Dr. L.deL. Harwood, Vaudreuil, Que.
3—Mad. Pauline Abbekerk 14976.	4	10	28	527.9	16.15	20.19	Lakeview Farm, Bronte, Ont.
4—Salla Princess Veeman DeKol 15265	4	6	17	400.60	14.91	18.65	H. C. Holtby, Belmont, Ont.
5.—Maggie Abbekerk 15118 . . .	4	6	14	426.9	14.73	18.41	Samuel Dickie, Central Onslow, N.S.
6.—Ina Belle Abbekerk DeKol 2nd 16223	4	8	8	448.1	14.40	18.00	A. Sherrick, Ringwood, Ont.

JUNIOR FOUR YEAR OLD CLASS

No. and Name of Cow	y.	m.	d.	Milk Lbs.	Fat Lbs.	Butter Lbs. 80% Fat.	OWNER
1—Lenora Hengerveld 17305. . .	4	4	2	542.2	22.58	28.22	
Record for 21 days	4	4	2	1528.4	65.78	82.22	J. M. Steves, Steveston, B.C.
2—Lakeview Countness Grace 14720	4	2	8	440.3	17.12	21.41	Lakeview Farm, Bronte, Ont.
3—Orndyke Artie Korndyke 20384	4	5	8	505.9	15.18	18.97	Dr. L.deL. Marwood, Vaudreuil, Que.

JUNIOR THREE YEAR OLD CLASS

No. and Name of Cow	y.	m.	d.	Milk Lbs.	Fat Lbs.	Butter Lbs. 80% Fat.	OWNER
1—Pietje Sara Jewel 19303 . . .	3	5	29	448.3	19.59	24.48	
Fourteen-day record . . .	3	5	29	886.6	37.87	47.34	A. C. Hardy, Brockville, Ont.
2—Het Loo Artis Pontiac 25349.	3	2	13	487.4	15.54	19.42	Dr. L.deL. Harwood, Vaudreuil, Que.
3—Prilly Pauline Abbekerk 18071	3	1	6	361.1	11.38	14.23	T. W. McQueen, Tillsonburg, Ont.
4—Lady Pietje Canary's Jewel 17314—213 day record . .	3	4	10	15956.2	610.09	762.60	J. M. Steves, Steveston, B.C.

SENIOR TWO YEAR OLD CLASS

No. and Name of Cow	y.	m.	d.	Milk Lbs.	Fat Lbs.	Butter Lbs. 80% Fat.	OWNER
1—Johanna Fairmount Hengerveld 28401	2	11	30	532.3	17.38	21.72	Jacob Leuszler & Son, Bright, Ont.
2—Grace Allen Ormsby 22333 .	2	11	3	384.2	15.49	19.36	Arbogast Bros., Sebringville, Ont.
3—Canary Vale Hengerveld 21692	2	7	26	414.6	14.74	18.43	Clarence Bollert, Tavistock, Ont.
4—Topsy Witzyde 21605.	2	9	3	372.6	14.63	18.29	Arbogast Bros., Sebringville, Ont.
5—Ourvilla Calamity Mercedes 22484	2	7	3	392.7	14.34	17.93	Laidlaw Bros., Aylmer, Ont.
6—Victoria DeKol Maud 22803.	2	9	25	355.7	14.31	17.89	Laidlaw Bros., Aylmer, Ont.
7.—Canary Netherland Queen 21508	2	9	24	359.1	13.35	16.69	Dr. L.deL. Harwood, Vaudreuil, Que.
8—DeKol Pauline Mercedes 22891	2	7	18	346.8	12.76	15.95	H. Bollert, Tavistock, Ont.
9—Ourvilla Helbon Colantha 29845	2	7	23	362.0	12.01	15.02	Laidlaw Bros., Aylmer, Ont.
10—Ourvilla Dutchland Colantha 21636	2	8	25	356.8	11.65	14.56	Laidlaw Bros., Aylmer, Ont.
11—Ourvilla DeKol Baroness 19951	2	10	7	321.1	11.60	14.50	Laidlaw Bros., Aylmer, Ont.
12—Maye DeKol Hartog 22910 . .	2	11	12	354.7	11.38	14.23	T. W. McQueen, Tillsonburg, Ont.
13—Mary Ann Hartog 22578 . .	2	10	13	330.6	11.44	14.31	T. W. McQueen, Tillsonburg, Ont.
14—Jubilee DeKol 23715	2	9	3	341.6	11.42	14.28	H. C. Holtby, Belmont, Ont.
15—Flossie Veeman DeKol 23525 .	2	7	27	354.1	11.30	14.12	H. C. Holtby, Belmont, Ont.
16—Lady Veeman Idaline 23717.	2	8	27	334.0	11.24	14.06	H. C. Holtby, Belmont, Ont.
17—Lakeview Dutchland Almeda 21113	2	8	13	334.8	11.06	13.84	Lakeview Farm, Bronte, Ont.
18—Princess Queen 23716	2	8	25	302.0	10.33	12.91	H. C. Holtby, Belmont, Ont.
19—Winnie Pride 23719	2	7	13	297.2	10.21	12.51	H. C. Holtby, Belmont, Ont.
20—Cobequid Helbon Jessie 21985.	2	11	30	304.2	10.07	12.58	Samuel Dickie, Central Onslow, N.S.

SPECIAL RECORD MADE AT LEAST EIGHT MONTHS AFTER CALVING

No. and Name of Cow	y.	m.	d.	Milk Lbs.	Fat Lbs.	Butter Lbs. 80% Fat.	OWNER
1—Spink Lady DeKol 18936 . . .	2	6	0	224.6	8.42	10.53	
Thirty-day record	2	6	0	924.7	35.09	43.87	Samuel Lemon, Lynden, Ont.

During the month of December the records of fifty-six cows and heifers were received and accepted for entry in the Record of Merit. The mature class is led by the Nova Scotia cow Miss La Honda, with 27.81 lbs. butter. This cow won championship in the dairy test at the recent Maritime Winter Fair, making, I believe, the largest three day butter fat record ever made in a show ground test. Among the senior four year olds first place is held by Homestead Pauline Colantha with 20.78 lbs. butter. Leonora Hengerveld leads the junior four year olds with the excellent record of 28.22 lbs. butter and is a worthy representative of British Columbia. In the Senior three year old class Ourvilla Susie Abbekerk stands first with the good record of 26.02 lbs. butter, while Pietje Sara Jewel leads the Junior three year olds with 24.48 lbs. In this class we have again to report the great heifer, Lady Pietje Canary's Jewel that completes 213 days' official work with 15,956.2 lbs. milk and 762.6 lbs. butter. In a class of twenty senior two year olds, Johanna Fairmount Hengerveld leads with 21.72 lbs. and among the Juniors first place is held by Nora Canary with 17.74 lbs. butter. Spink Lady DeKol makes a record of 10.53 lbs. in 7 dys. and 43.87 lbs. in 30 daps in the two-year-old class ten months after calving.

W. A. CLEMONS, Secretary

THE DAIRY

QUEBEC CHEESE

What they think of it in England

MANY volunteers from the little village of Guildhall, in the county of Norfolk, England, are enrolled in Lord Kitchener's army. In order to help the families who by the departure of the bread-winner are left in poverty, a committee of the principal citizens of the county has been organized under the name of "Norwich War Executive Committee". This Committee asked the Imperial Government to be good enough to provide them with a number of the round flat cheeses which have been so generously given by the Government of Quebec. The Imperial Goverment is willing to grant this request, and in recognition of the help received the Norwich War Executive Committee has moved a vote of thanks to the province of Quebec in the name of all the citizens in their committee and their county. The Prime Minister, Sir Lomer Gouin, has just received copy of this resolution.

SUGGESTION FOR THE IMPROVEMENT OF MONTREAL'S MILK SUPPLY

THE following recommendations are attached to the report of Principal Harrison, Dr. Savage and Mr. Sadler upon the milk supply of Montreal:

In view of our present knowledge of the milk supply of Montreal, we earnestly recommend to those in authority and to the milk-consuming public, that the legal statutes of the province, and the regulations and by-laws of the city of Montreal relative to the sale and distribution of milk be so amended as to include the following points:

1. The grading of city market milk.
2. Payment for milk according to this grading or scoring.
3. Confiscation of milk as poor in quality as that which we have designated Grade "D."

(Grade D includes milk having over 5,000,000 bacteria before pasteurizing, over 100,000 bacteria after sterilizing, over 10,000 bacteria of the colon group or over 100,000 bacteria of the liquefier group. Such milk is unfit for human good. Of the Montreal samples analyzed, one-fifth of those collected in the country in the summer and over two-thirds of those collected in the city, whether in winter or summer, were found to be of this grade.—Ed.)

4. The conferring of such power upon the Chief Food Inspector and his staff as to enable him to—

(*a*) Inspect and maintain at a certain standard all farms shipping milk to Montreal.

(*b*) To issue licenses subject to recall, for the production, handling, sale and delivery of milk consumed in the city to those who satisfy the requirements (and to refuse licenses to others).

(*c*) To fine offenders for violation of regulations.

(*d*) To insist upon the provision of proper equipment in all shops, stores and other places were milk is retailed.

5. The technical examination of men in charge of works where bottling, pasteurization, clarification, cooling, etc., are carried out.
6. The enforcing of pasteurization, i.e., heating milk to a temperature of 145 deg. F. twenty minutes, followed by subsequent cooling.
7. Frequent visits and tests by the city milk inspectors to enforce proper pasteurization.
8. Systematic publication in the press by the Chief Food Inspector of analyses made of city milk; giving also the names of the vendors from samples are taken.
9. The instituting of an educational campaign among consumers; emphasizing the value of milk as a food, the necessity for, and advantages of a pure milk supply, and the duties of the consumer.
10. The general improvements on milk-producing farms, so as to be in keeping with the particulars of our scoring system.
11. The use of refrigerator or iced cars of transportation.

SUCCESSFUL DAIRYMEN IMITATE MONTH OF JUNE

"IMITATE June if you would succeed in the winter feeding of dairy cows," is the suggestion offered by representatives of the college of Agriculture, University of Wisconsin, in the December bulletin of the Wisconsin Bankers' association.

"Nature," they tell us, "gives the dairyman a model in the month of June. This is recognized to such an extent that the very words, "June pasture" suggest the ideal conditions for the production of milk and butterfat of the highest quality and in the greatest abundance."

"June pastures provide a well balanced ration, plenty of succulence and an abundance of fresh air, sunlight, pure water and a normal amount of exercise."

A ration for dairy cows recommended by the authors of this bulletin consists of from 25 to 45 pounds of silage, from 10 to 15 pounds of clover hay, and one pound of a grain mixture for every three or four pounds of milk produced. As a grain mixture they list 30 parts wheat bran, 30 parts ground oats, 25 parts corn meal, and 15 parts cotton seed meal.

IS MACHINE-MILKING A FAILURE IN QUEBEC ?

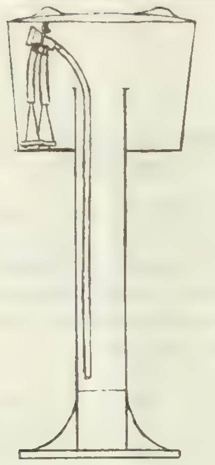
NUMEROUS milking machines are in operation in the districts which supply Montreal with milk, and the Macdonald College bulletin dealing with this supply mentions nine outfits. Machine-milking has a number of advantages over hand-milking and the farmers realize this. These advantages are as follows:—

1. Reduction in time and labour of milking.
2. Much easier to get farm help and especially more intelligent helpers.
3. Able to pay higher wages as less help is necessary.
4. Physical defects in a cow are of less importance.
5. In case of necessity one man can handle 50 cows.
6. Milk cleaner, keeps better and is preferred by city dealers.

The first five points the farmer can ascertain for himself, but the fact that the milk is cleaner has to be decided by a bacteriologist. Theoretically the milk should be cleaner as all stable infection is excluded. Further, it has been proved in the different Experiment Stations, where the machines were handled by experts, and we have in our possession numerous figures relating to milk produced under farm conditions, which show a very low bacterial content. These results were obtained in New York State, the home of the milking machines, and the farmers we met there showed a thorough understanding of their machines. But results mentioned in the Macdonald College Bulletin indicate a different state of affairs for Quebec. As is pointed out, the results on nine farms where the milking machine was used were poorer than on neighbouring farms where the cows were milked by hand. This condition is serious and ought to be investigated to find the reason why the Quebec farmer should not get the same results as his brother farmer in New York State with one and the same milking machine.

We suspected this condition for a long time, and,

MILKING-MACHINES IN USE.



Sterilising Solution Tank
for
Teatcups and Tubing

speaking in a general way it seems to us that the Quebec farmer does not give the same care and thought to his work with the milking machine as his neighbours across the line. Without definite proof we do not like to fix the blame on the farmers; we know of cases where agents were satisfied to sell the machine and did not take the trouble to make certain that the owners understood their new tools and treated them in the right way. In the meantime we will mention here again the right way to look after the machine when not in use.

After milking, the machines must be thoroughly cleaned with hot water and washing soda and the pails and other metal parts put in boiling water for half an hour. The rubber tubes cannot stand such treatment, but are submerged immediately after cleaning in an antiseptic solution in the tank specially built for this purpose. The solution consists of:—

Water..	72 lbs.
Salt	7 "
Chloride of lime	½ "

New chloride of lime should be added twice a week and the solution watched carefully, as a solution kept too long or in the wrong way is a real source of infection. Before using the parts again they must be rinsed in cold water.

Farmers following these simple directions are bound to find a marked improvement in their milk.

J. VANDERLECK

THE OUTLOOK OF THE DAIRY FARMER IN EASTERN CANADA

By W. F. Stephen, Huntingdon, Que.

(Continued from January issue)

I believe in the no distant future similar regulations will apply to all milk and cream delivered to our creameries and cheeseries. This would be a move in the right direction and should be encouraged by all who wish the business of the dairyman to be put on the highest plane. Why should it not be so? Is not the dairyman engaged in one of the finest businesses in the world, a business requiring a large amount of energy and brain capacity, which, coupled with a limited amount of capital, will bring a reasonable competence and a large mesure of success to any engaged therein?

The dairyman is the producer of necessities for which there is a growing demand. The consuming public is more and more demanding that these be pure, wholesome and of choice quality. The farmer who aims to produce such products will receive a fair recompense for the extra labor involved. Quality counts today as never before.

The home consumption of dairy products has so increased that it has kept our farmers busy to keep pace with the demand at home and hold our trade abroad. In fact, the latter has not been done. The increased home consumption has almost stopped the exportation of butter, and our export cheese trade has decreased over 25 per cent largely from the same cause.

The opening of the United States market to milk and cream has changed conditions in many localities, and instead of butter cream is the output of many creameries, and this is shipped across the line. This means a readjustment of conditions in those localities. With the ever increasing population in the United States there will be an increasing demand for both milk and cream. This, coupled with the growing consumption of milk, cream, butter and cheese at home, and the continued demand for Canadian Cheddars in Britain, indicates to our dairymen that their business is on good footing and that they have no cause for alarm.

Further, there is no indication that dairy products will become any lower in price but rather that they may go higher with an appreciable improvement in quality, consequent upon the adoption of sanitary methods in production, and technical knowledge in manufacture.

How will this affect the dairy farmer? I believe there is a good future before the breeder of high-grade dairy cattle. Many milk producers are not in a position, (some would add "nor do they find it profitable" a statement which I doubt), to raise the cows needed in their business. With an increasing demand for high class milk in our cities, so will the demand for cows of large production increase.

Our Federal Department of Agriculture is doing work of incalculable value in organizing and conducting cow-testing associations in various centres. This work demonstrates that we have many cows capable of large production but also a great number of cows that are kept at a loss. This work has also proved to hundreds of dairy farmers the wisdom of keeping cows of large capacity, with the result that thousands of unprofitable cows have gone to the canneries never to return, and no tears have been shed o'er their departure.

To breed and grow cows of big capacity, it is recognized that pure-bred sires from record families must be used. The immature and scrub sire of nondescript breeding, although not so common as a few years ago, is still too much in evidence, judging by what may be seen at the cattle markets every fall. Indications point to the scrub sire being replaced by the pure-bred sire of merit or even of average breeding. The fact that pure-bred sires are being selected by many farmers in the cattle-raising districts is one of the most hopeful signs and indicates the progressive spirit that possesses many of our dairy cattle breeders. Here is where the breeder of registered stock may profit, for he, if he has good business acumen, will take advantage of the situation and endeavour to meet the demand for pure-bred sires.

Fewer dairy cattle have changed hands during 1914 than in 1912 and 1913. The business has received a temporary check, owing to the financial depression, caused in a great measure by the terrible European war now going on. It is impossible to predict what effect this war will have on the Canadian dairy farmer's business. I cannot think for one moment there should be any uneasiness because of this, and I am convinced that there is a brighter future than ever before our dairy farmers.

Taking a broad view of home conditions we find that there is no surplus of cows nor young heifers at present; in fact there is a shortage in the Western provinces, both of high grades and pure bred cattle. Dairying is steadily increasing in our prairie provinces, owing to the growing demand for dairy products in Western cities, also because of the uncertainty of grain farming, and the lack of fertilizing material, and because dairying brings the farmer a constant and sure remuneration for his labor. When money becomes easier there will be a loud call from the west for dairy cattle, and that at prices that will pay the breeders.

I think, too, we may do a considerable business with the United States, as dairymen across the line have taken our milch cows in large numbers, prior to the regulation which came into effect on July first last, which may only be a temporary enactment. I am confident there will be a re-adjustment of United States regulations in the early future. If so, there will be an interchange of live stock as heretofore. I do not anticipate that prices for good dairy stock will become abnormally high, but there is every reason to believe that profitable prices will be realized by the breeders. The prices of registered cattle usually fluctuate more than do the prices of grade stock, and should we not see excessive prices paid for this class of stock for several years our cattle breeders must not be discouraged but be content with prices that will justify raising stock in large numbers, for which there will be a ready market.

The breeder of registered dairy cattle must make records of milk and fat. Indications point to the fact that for foundation stock farmers want females, and still more sires, from ancestry with a record. The registered cow of the future must show that she is capable of large production, and if she has a yearly record to her credit so much the better. We must learn to realize that *perform* is of as great importance as *form*.

To attempt to say how the war will affect our dairy cattle trade is mere speculation. The devastation of Belgium has already destroyed the dairy business of that country. It is reported that the restaurants and hotels of Paris cannot get milk and cream to supply their tables, the cows being commandeered to feed the army. If this is true now, we may imagine what serious conditions will prevail before the war is over. Who knows but what these countries, and even Great Britain,—the country that has supplied the world with foundation herds and flocks,—may want dairy cattle to replenish their herds. If so, Canada can, will and must do her share in supplying stock from her many choice herds. This situation is not improbable, and in fact it is altogether likely that our dairy cattle will be wanted in Europe when the war is over.

The adage "Foresight breeds success" applies to the present situation. It is for the dairy farmers of eastern Canada to observe the signs of the times and to prepare to supply not only the West but Europe, if necessary, with Canadian bred dairy stock. Dairy farmers should look upon it as doing their part in this time, when the voice of our country calls for every Canadian to do his duty. A spirit of true patriotism should prompt our dairy farmers to keep their herds up to the maximum standard in quantity and quality. Only then will we be able to meet any emergency that may arise. I consider the outlook for the dairy farmers of Eastern Canada was never better. My ground reasons for saying so are the increased demand for dairy products, for high grade cows, for pure bred sires, and all at good prices, the increased interest in co-operative cow-testing and Record of Performance work, and the probability of our supplying Europe with choice breeding stock in the not far distant future. Optimism and patriotism should go hand in hand in stimulating the dairy farmers of Canada to do their best at this most critical time in the history of the British nation.

POULTRY

FREE COURSE TO POULTRY RAISERS

A Short Course of Instruction and Practice in Poultry-keeping will be given at Macdonald College, Ste. Anne de Bellevue, from February 15th to March 6th inclusive.

This Short Course is intended to assist in supplying the demand for practical knowledge in the raising of poultry. It will be of considerable value to all those who are now keeping fowls as well as to those who intend to start in the poultry business. Lectures will be given every day and hours will also be provided for work in feeding poultry and in incubation and brooding.

Some of the phases of the poultry business discussed will include:—Profits in Poultry Keeping; Laying Out a Poultry Plant; Poultry Keeping on a Town Lot; the Intensive and Extensive Methods of Poultry Culture; Poultry House Construction; the Breeding and Judging of Utility Poultry; Incubation and Brooding; Methods of Feeding Poultry; Markets, and Marketing Poultry Produce.

The Professor of Biology will give lectures on Poultry Zoology including:—the Anatomy of the Fowl; the embryology of the Chick; and the Parasites of Poultry.

The Professor of Cereal Husbandry will give a number of lectures on Crop Production and Soil Management as related to poultry raising.

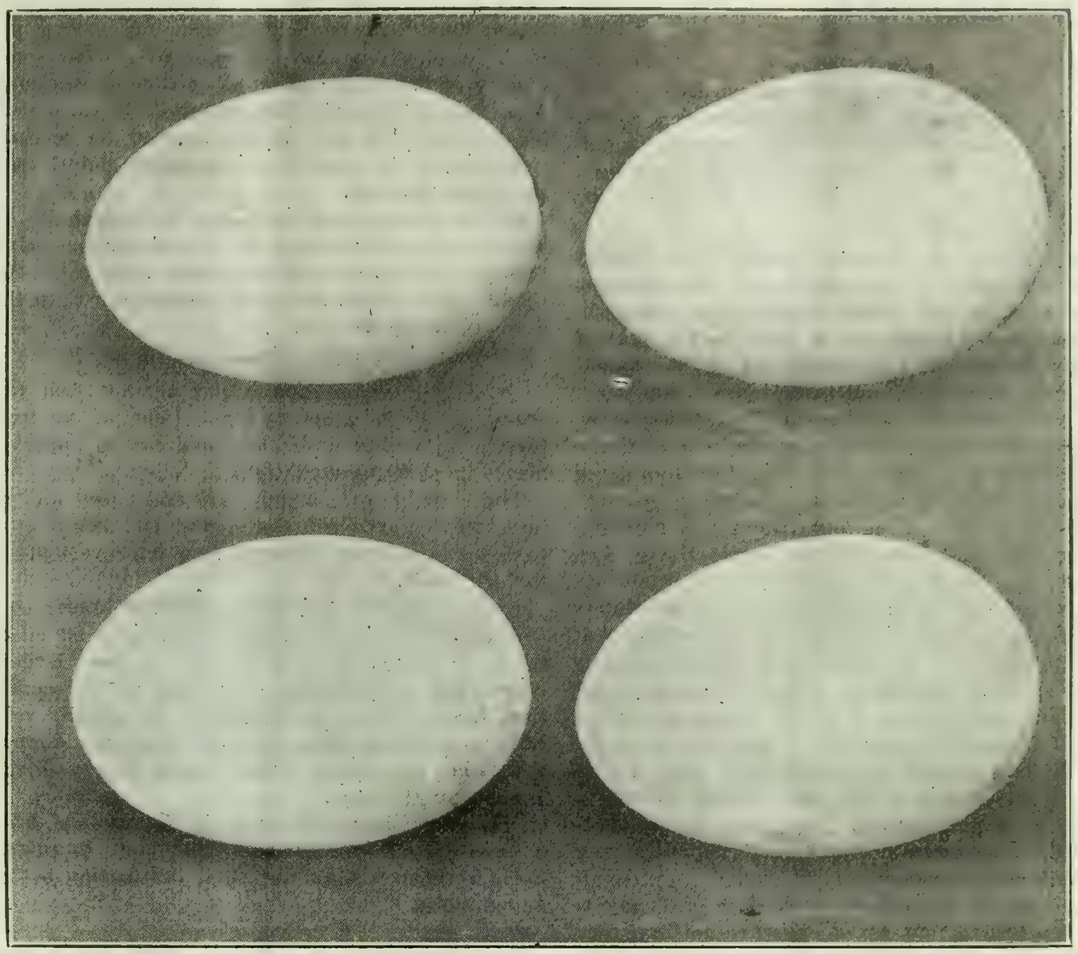
The Professor of Horticulture will give a course of lectures on the Growing of Small Fruits; the Care and the Management of the Orchard, and other horticultural subjects of interest to poultrymen.

The College Veterinarian will give lectures with demonstrations on the Hygienic Requirements of Poultry; Cleanliness, and various poultry diseases.

The Demonstrator to Homemakers' Clubs will give lectures and demonstrations on Trussing Birds for the Table, Roasting and Serving Poultry, and the Value of Poultry and Eggs in the Diet. This course will be of special interest to all housekeepers.

The poultry plant at the College gives excellent opportunity for the study of the practical side of the industry. The course will be full of up-to-date information designed for practical poultry keepers, and it should enable all interested to become more familiar with the principles of successful poultry keeping.

For the Short Course Announcement and other information those who wish to attend should write The Principal, Macdonald College, Que.



Showing desirable eggs for incubation. These eggs are of good size and good shape. Good chicks can be hatched only from good eggs.

THE SELECTION OF EGGS FOR INCUBATION

Eggs to be incubated should be selected with care. All eggs will not produce chicks. On the other hand, there are many fertile eggs which may produce chicks, but the chicks may be undesirable for rearing. The best success, either in natural or artificial incubation, can only be expected with eggs which will hatch well and will produce strong chicks. The successful renewal and improvement of the flock is not wholly a problem of incubation. It is only one of many factors and one which must be considered as a means to an end.

If the germs are naturally weak, the most careful attention during the incubation of the eggs and the brooding of the chicks will not make up for the lack of vigor. Negligence in the management of the breeding stock and improper methods of breeding often result in poor hatches and weak chicks.

The vitality of future generations depends upon practices followed at present. *The breeding stock is the foundation of the poultry industry.* If breeders would use more care in the selection of their breeding stock and adopt improved methods of breeding, more satisfactory results would follow in the hatching of chicks. In order to produce eggs most suitable for incubation, the flock should have an abundance of constitutional vigor, be well housed, receive proper food, well fed, and should be carefully managed at all times.

POOR EGGS PRODUCE POOR CHICKS

A careful selection should be made of the eggs laid by the breeding stock. Small eggs produce small chicks, as these should not be incubated. An egg uneven in shape is not suitable for incubation. Extremely long and very short, round eggs should be discarded. All of these undesirable eggs can be detected by their external appearance.

However, an examination of the external appearance only of the egg is not sufficient. An egg may appear to be all right, but, when the contents of the egg are examined, it may be found to be worthless for incubation.

Some eggs may have cracked shells. These may be detected by the use of the tester or candler, such as is used in testing eggs during incubation. Another method of detecting cracked shells is to gently tap two eggs together, and if there is a slight ringing sound, the eggs may be considered all right. If there is a dull sound then one of the eggs is cracked and should be avoided.

There may be some eggs with "broken yolks"; that is, where the vitelline membrane is broken and the contents of the yolk are mixed with the albumen. Such eggs could not hatch chicks.

An egg with a "blood yolk" is not satisfactory. The yolk is distinctly red in color, and such an egg is even rejected by cold storage firms when candling eggs before storing.

A "buttermilk egg" is one which, when candled, presents a coarsely spotted appearance. It has been formed from experience that the majority of "buttermilk eggs" are infertile, and from those which are fertile weak chicks usually result.

GOOD CHICKS FROM GOOD EGGS ONLY

The normal egg is one weighing about two ounces, with a smooth surface, and oval in shape. The fresher the egg the more suitable it is for incubation. As eggs become old the germs become weak. For all practical purposes the eggs may be held for two weeks and will still hatch well.

Eggs kept for hatching should not be exposed to either extreme heat or extreme cold. The best temperature in which to keep eggs for incubation is from 40° to 50° Fahrenheit. It is well to turn the eggs occasionally.

Poultrymen would save a great deal if they would test their eggs, before putting them under a hen or in an incubator, and take out all eggs which would not produce good chicks. Every egg which does not produce a chick is a loss.

It is not inferred, however, that infertile eggs may be selected out of those to be incubated. There is no known method, except by incubation, of determining whether an egg is fertile or infertile.

M. A. JULL

POULTRY TRADE MEETING

The Third Annual Meeting of the Canadian Produce Association was held at the Poultry Department of the Ontario Agricultural College at Guelph on January 11th and 12th. Over 200 members were in attendance and the program was immensely interesting. Every province was represented and the strength of the Association may well be judged by the work under consideration.

The Association is chiefly concerned in the poultry, egg and butter trade, and at the Guelph meeting all attention was focussed upon the poultry and egg business. In regard to the improvement of trade some far-reaching steps were taken which will mean much toward the conservation of existing losses, particularly in the egg trade.

Egg Standards

The marketing of eggs has always been a very serious problem, beset with many obstacles. Losses due to improper methods of marketing are appalling, and still little improvement has yet been made. There has been no standard for the various grades and classifications.

Professor W. R. Graham, head of the Poultry Dept. at Guelph, submitted for the consideration of the meeting a standard grading and classification of eggs. The classes of eggs on the market are divided into 1. Fresh-gathered. 2. Storage. 3. Preserved. 4. Dirties, and 5. Bad Eggs, which are unfit for food. These are the standard classes given to eggs according to their condition when offered for market. It is understood that Fresh-gathered eggs shall be really new laid and shall be marketed pratically as soon as laid. There are, however, four grades of Fresh-gathered eggs—Extra Special, Extra, No. 1 and No. 2. Extra Specials are the highest quality of eggs offered — absolutely new laid, even with the bloom still on, weighing at least 24 ounces to the dozen, and with practically no air space. Extra should weigh 24 ounces to the dozen and may have a small air space, measuring about 1-3" down the egg. No. 1 eggs constitute the largest class offered on the market. They are of good quality but are not good enough to sell as Extras or Extra Specials. They have an air space ¾" deep and it may not necessarily be stationary. The yolk may be moderately visible.

Eggs falling in the above three grades may be used for boiling, but No. 2 eggs are not satisfactory. One is taking too big a risk in ordering a No. 2 egg in the shell. This grade constitutes all eggs that will not fall in the other grades. They are weak watery eggs, weighing about 22 ounces to the dozen.

Damage in Transit

Great losses are sustained through the damage of eggs in transit. This loss results largely from rough handling and holding over for a long period. In very few cases do eggs posses the same quality at their destination as at time of shipping. They lose quality while being shipped. It was urged, however, that if 90% of the eggs at the destination graded the same as at shipping point, they should be accepted.

It was pointed out that eggs incubated for 72 hours are unfit for food. At the same time many farmers ship eggs which have been under a hen for that length of time or left in the hot sun until the germ starts to develop.

Shipping Conditions

Dr. M. E. Pennington, Chief of the Food Research Laboratory of the U. S. Dept. of Agriculture, gave a very interesting address on improvements in shipping conditions.

The methods of packing cars and cases was illustrated by excellent slides, and Dr. Pennington gave many suggestions regarding improvements in the egg trade.

Eggs in transit should be candled under cold storage conditions, otherwise sweating is bound to result. Irregular packing in cars has been largely responsible for shipments arriving in bad condition. Less than car-lot shipments are usually very bad, since many times cases of eggs are shipped with other produce or freight which is very objectionable for the eggs.

Nearly 72 hours are required for cooling down a case of eggs in a carload shipment to 40-34°. Some shipments arrive at their destination before being cooled.

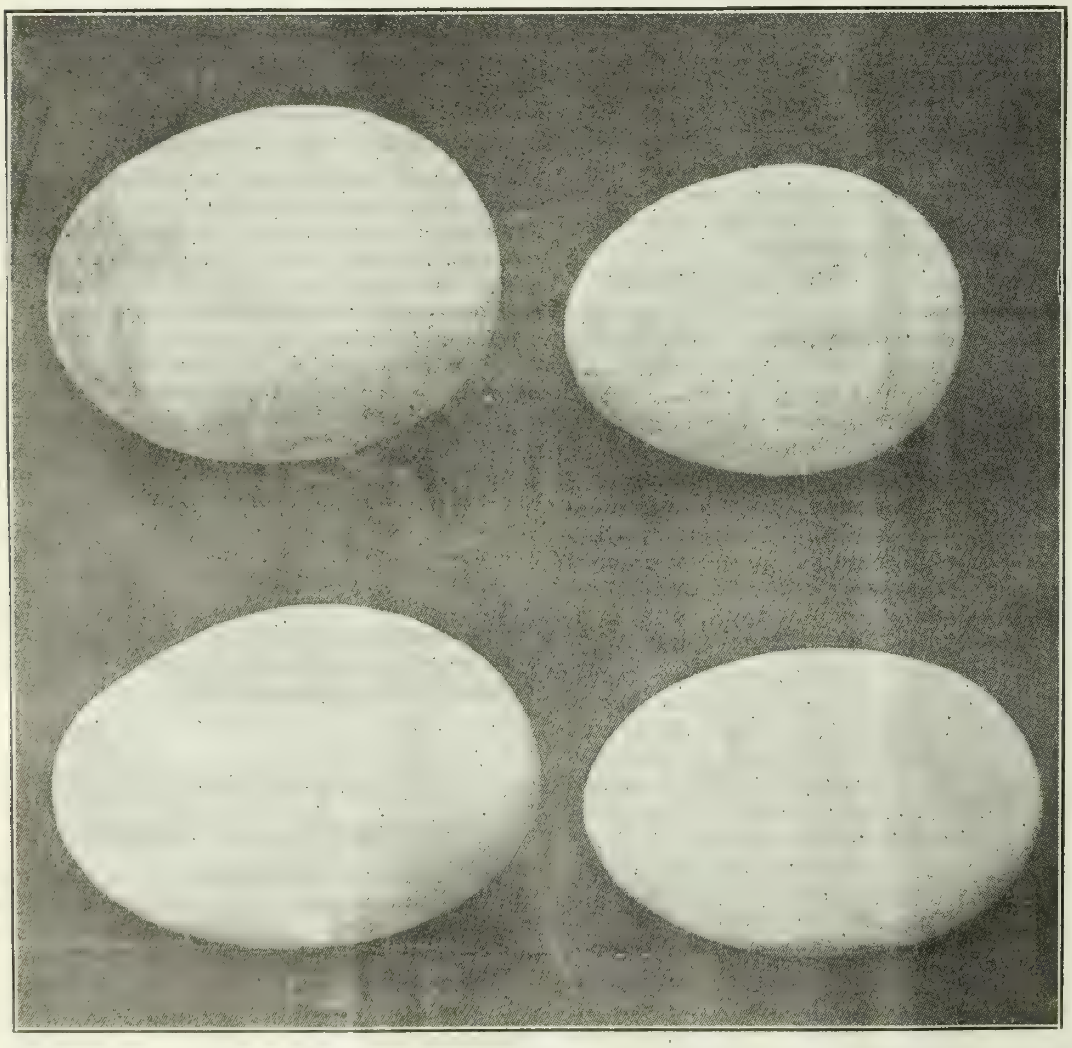
Free Egg Cases

The Association passed a resolution regarding the adoption of the free egg case to take effect January 1st 1916. This means that the first shippers of eggs in cases must furnish new cases and that buyers will buy their eggs net, excluding the cases. The cost of the case will eventually be added to the price of the eggs so that no class of dealers will be affected, but through using new cases the quality of eggs marketed will greatly improve. Butter and berries as well as most other products are sold in new free cases, and eggs should also be sold this way. In the past many good eggs have been completely spoiled through shipping eggs in old musty and dirty cases.

Egg Cars

A matter of considerable importance was contained in an appeal made to the Federal Government to have special refrigerated egg cars run on the main railway lines. The idea is to enable shipping eggs more readily and quickly than is possible at present. These egg cars should run twice each week and collect small shipments all along the line. It is to be hoped that egg cars will be run in Quebec as well as in Ontario because it would mean larger prices for the farmers.

M. A. JULL



Showing undesirable eggs for incubation, not one of these eggs is well shaped; some are too short and others are too long. Small eggs produce small chicks.

VARIETY OF FOOD MAKES HENS LAY MORE OFTEN

VARIETY of feed is what fills the winter egg basket. Corn three times a day as a rule builds up fatty tissue, makes hens lazy and reduces profit.

"Animal food, ground food and a generous supply of green stuff produce the best results for laying fowls," says J. G. Halpin, head of the poultry department of the University of Wisconsin.

The exercise so needful for poultry can be provided in winter by working the grain ration well into the litter of fresh straw that should be provided as a carpet on the feeding floors. A good variety of grain should be provided, some corn, wheat, oats and barley mixed together, or fed alternately, makes a satisfactory ration.

A grain ration for winter use that has given good results at the experiment station farm consists of two parts corn, two parts wheat, one part oats and one part barley.

It is recommended that the ground feed be placed in a small mash box or trough where the hen can have ready access to it. The following mixture of ground feeds is considered to be quite satisfactory: One hundred pounds bran, 100 pounds middlings, 100 pounds ground corn, 50 pounds mealt sprouts, 50 pounds meat scraps, and sufficient salt. During the fall and winter about 25 pounds of oil moil should be added to this mixture. Where these feeds cannot be had, others of a like nature may be substituted, the main idea in all instances being to get a wide variety.

Buttermilk and odds and ends from the kitchen, and such green food as cabbage, alfalfa, silage and turnips are great aids to egg production. Not only more eggs, but eggs rich in protein and high in vitality with firm shells are likely to result where proper thought is given to feeding systems.

WOMAN'S WORLD

HOMEMAKERS' CLUBS

DURING the January Short Courses conducted by the Macdonald School of Household Science clubs were organized at the following places:—

Wolfe County.
Marbleton:—
President.—Mrs. Willie Oughtred.
Vice-Pres.—Mrs. Horace Westan.
Secretary.—Miss Mabel Rolfe.

Huntingdon County.
Hemmingford:—
President.—Mrs. R. W. Blair.
Vice-Pres.—Mrs. Reddy.
Sec.-Treas.—Mrs. Cairns.

Shefford County.
West Shefford:—
President.—Mrs. C. E. Hayes.
Vice-Pres.—Mrs. Katie Quinlan.
Sec.-Treas.—Miss V. Marchessault.

FOODS AND FOOD PREPARATION

Miss Campbell's usual monthly article is omitted this month on account of pressure of outside work, but will appear in next number.

MACDONALD COLLEGE SHORT COURSES IN HOME ECONOMICS

By the Staff of the School of Household Science

BEGINNING January 5th and ending January 15th the School of Household Science, Macdonald College, held for the second time a series of Short Courses at various centres of the Province. Last year saw the beginning of this movement, and the appreciation shown then justified a similar course being planned this year.

The following table shows the number of meetings held and the attendance at each:—

Name of Place	Number of Meetings	Attendance 1st.	2nd.	Av.
Knowlton,	2	35	23	29
West Shefford,	2	35	40	38
Marbleton,	2	30	30	30
Sawyerville,	2	90	100	95
Scotstown,	2	30	22	26
Hemmingford,	2	54	50	52
Coaticook,	1		21	21
Lennoxville,	2	37	50	43
Breckenridge	1	26		26
Total number of meetings	16	Total average		40

Although the attendance was in some cases not so large as last year the courses, judged from the standpoint of interest and enthusiasm, were even more successful.

The lectures and demonstrations on the courses this year were as follows:—

Textiles—Miss K. A. Fisher;

Pure Food Laws—Miss K. A. Fisher;

Feeding Children and School Lunches—Mrs. T. T. Rutter;

Planning the Daily Meals—Mrs. T. T. Rutter;

Poultry Keeping for Women—Miss Lena Nicholson;

Methods in Laundry—Miss A. E. Hill;

The Convenient Kitchen—Miss A. E. Hill;

The Pictures on our Walls—Miss W. Thompson;

The Relation of the Homemakers' Club to the Rural School—Miss Philp;

How to Keep Household Accounts—Miss Philp;

Demonstration in Millinery—Miss Alice Zollman;

The Homemakers' Club and its Place in the Community—Miss F. Campbell;

The Girl on the Farm—Miss F. Campbell.

The meetings at Knowlton, West Shefford, Sawyerville, Marbleton, Lennoxville and Hemmingford were particularly well attended, and the audiences certainly showed their appreciation of the efforts of the lecturers. At Breckenridge the attention and appreciation made up for the audience which was not so large as expected on account of the state of the roads. At Coaticook the excuse given for the rather small turnout was the inclement weather and the fact that the place of meeting had been changed. The few who had made it a point to attend were much pleased with the instruction they received. At Richmond a W. C. T. U. re-union and a short course for Sunday School Teachers were going on at the same time and, consequently, no one came to the Hall until about 4.00 o'clock, when about nine women arrived. Miss Hill spoke to these on Methods of Laundry Work, and they were very much interested. They assured us that had it not been for the other meetings we should have had a good attendance.

The members of the Staff of the School of Household Science wish to thank the ladies of every community visited for their welcome and hospitality.

MAKE YOUR MARMALADE NOW!

JUST because this is the very best time. Grapefruit, lemons, oranges are now abundant, of good quality, and, above all, cheaper than later on. Also next month we plan to do spring and summer sewing and prepare everything—including ourselves, for — have we the courage to speak the word? "Spring cleaning". Then comes canning pineapple, and by that time the snow has gone and our duties are legion. Our tomato, onion, beet plants, etc., must be started in the house from the seed and our plants indoors and out require so much attention. Appetites begin to flag, and the burden of planning the family meals will take more thought and time then than now. Our children will be in need of more attention. The strain of school then begins to tell itself in leaden eye and tired body, and still the house-work keeps up—yea, is increased as the weeks go by, and as the mother seems to have no say in the matter the only remedy lies in helping to lift the burden—in other words, she will have to leave her work each night to prepare her child's school work which the child, in its helplessly tired condition could not finish otherwise before nine o'clock.

However, the subject is marmalade. Happy is the housekeeper who already has the year's stock of marmalade put aside. It is true jelly and jam must be made, but nothing can take the place of marmalade in a breakfast menu. We must make it!

To keep the family in purchased marmalade would be gross extravagance. Nothing "pays better" than making marmalade at home. Then the cost isn't more than from ten to twelve cents a pint, while the same amount at the store costs from twenty-five to thirty cents. Aside from the point of extravagance, the home-made article is purer and of superior flavor and quality.

It is wise to form "habits" in our housekeeping duties. When this is done much of the labour is diminished, for the habits of procrastinating; dwelling upon proposed lines of work indefinitely; talking them over continually, and pitying ourselves, are most fatiguing, devitalizing habits and affect others as well as ourselves.

From the middle of February until early in March should be the marmalade season.

The habit of keeping a record book in which to enter the dates, amount of fruit, amount of sugar, amount of paraffin, total amount of marmalade in pints, total cost, cost per pint, is a very excellent idea. We learn the following things from such a record:—

1. How much fruit will be required next year.
2. How much sugar.
3. How much paraffin.
4. How many jars will be required for that amount.
5. What next year's marmalade will cost.
6. The amount of marmalade used each month on an average.
7. The amount of paraffin needed each year for total marmalade.

The note-book will carry all this information, and it will be accurate in details.

Probably after one or two years' trial the housekeeper will become so thoroughly interested in the question of the home preservation of fruit that she will call her friends and neighbours together and form a "club" for the manufacture of the marmalade, jam, jelly, canned fruit of its members. Possibly one of the members may have a large room—an outside kitchen would be excellent —which she would gladly allow the club to use on 'working days'. Equipment necessary for the work could be stored in this room. Great care should be exercised in the selection of apparatus, which would include the following:—A good range or stove, a large zinc-topped table with drawers for wooden spoons, jelly bags, etc., a large canning outfit or fruit sterilizer, large aluminium kettles for boiling the fruit, a good fruit slicer, scales with weights for 50 lbs., a dozen paring knives of good quality and a few smaller utensils. Sugar would be ordered by the barrel and fruit by the crate, thus lessening the cost very materially. Young housekeepers and those with small families would find this scheme well worth while, while the busy mother with a large family would be saved much labour by this co-operative method of preserving fruit. The members with the most time would gladly assist the others by donating their services at times when the burdened members find it difficult to get away. Three evenings would finish all the marmalade. Jelly would require only two—that is, if the equipment were adequate. The time spent together would be profitably spent in every sense of the word. Questions would be continually arising and increased interest would manifest itself in investigations of many points, and before long this spirit of enquiry would lead to the consideration and discussion of other matters which should be of vital interest to all homemakers. The commercial side of home-canning, jelly and marmalade making is well worth consideration by mothers who wish to keep their daughters at home and really feel that the family income fails to provide them with many things they should have. With an equipment as indicated above the profits would be high, once the initial cost was provided for. There will always be a ready market for foods prepared at home. All that is necessary is a first-class "article" and a little advertising will do the rest. In conjunction with either a tea-room, chicken raising, bee-keeping or other hobby the annual income should be very considerable.

Marmalade may be made from oranges alone. Seville or bitter oranges are best for this purpose, as the product is much clearer and of better quality. Instead of Seville oranges alone, any orange may be used in combination with grapefruit or with lemons, or a combination of the three may be used, all making equally good marmalade.

Marmalade should always be clear and never of dark or brownish colour. The jelly should be very soft. A jar of marmalade turned out on a plate should shake readily when the plate is moved —it should be "wobbly" jelly. The fruit should show itself in the thinnest strips suspended throughout the jelly. The rind should not be soft but tender and easily distinguished from the jelly by the teeth.

A marmalade slicer is certainly a valuable labour-saving device. The slicing of the fruit by hand into the very thinnest strips is only interesting for a short time, and when there is no co-operative society three or four friends working together would find the work much less tedious. Husband, wife and older children could complete half a crate of fruit in this way in a short time.

All the odd jars and those unsuitable for canned fruit should be thoroughly washed and scalded before using. For small families half-pint jars are most suitable.

The waxing is not done until the marmalade has stood from 12 to 24 hours. All the individual pieces of wax should be washed and dried as each jar is opened and dropped into a clean, empty molasses can with a cover that lifts out. When no more will go in the covered can should be set on the stove only long enough for the paraffin to melt. There will then be room in the can for more. Care should be taken when dipping melted paraffin with a spoon that none runs down the sides of jars. These errors make extra work. Economy of time is a very important matter in housekeeping.

The following precautions must be taken during the final boiling:—

1. Watch the mixture or it may either boil over or stick to the bottom in places and burn. Stir very often and allow the mixture to boil gently.
2. Test frequently as for jelly. As soon as a tiny drop "jells" on a cold plate remove kettle and pour at once into jars.
3. Remove scum thoroughly.

The recipes given below are all "tried" ones and give excellent results. Variety in marmalade as well as in other foods is to be desired.

Do your part in increasing the number of exhibits in marmalade at your fall fairs this year.

Recipe 1. *Orange Marmalade.* Use only bitter oranges. To one pint finely-sliced fruit add 2½ pints of cold water and let it stand overnight. Cover seeds and all tough fibre with water in a separate bowl and strain liquid off seeds into the soaked fruit the next morning. Boil 1½ hours, and again let it stand overnight. The following day weigh and to each pound of fruit add 1¼ lbs. sugar (granulated). Stir well and boil until a little well-cooled will jelly. It should require not longer than forty-five minutes. Skim during last boiling.

Recipe 2. *Grapefruit Marmalade.*
6 grapefruit.
4 lemons.

Cut in quarters and discard seeds. (Seeds may be covered with water in separate bowl over-night, then the liquid strained into the fruit pulp.) Slice fruit thinly as possible. Weigh and to each pound add three pints cold water. Set aside for twenty-four hours, then boil gently until rind is perfectly tender. Set aside again until next day. Weigh again and to each pound add 1 lb. sugar. Let boil until peel is well-suspended or until liquid jellies when tried on a cold plate.

Note: this recipe makes from 16 to 18 pints of marmalade.

Recipe 3. *Orange Marmalade.*

Cut three oranges in quarters crosswise. Remove seeds and put through food chopper. Then cut one lemon in quarters crosswise, remove seeds and put through food chopper. Put prepared fruit in preserving kettle and add eleven cups cold water (5½ pints). Cover and let stand twenty-four hours. Place on range and bring slowly to boiling point and let simmer 1½ hours. Add four pounds of sugar and again let it stand twenty-four hours. Again bring to boiling point and let simmer one hour or until liquid will jell when a drop cools on a cold plate.

Recipe 4. *Marmalade.*
5 oranges,
1 grapefruit,
1 lemon,
5 pints cold water,
5 lbs. sugar.

Method: Cut fruit in halves crosswise. Remove with point of paring knife the pulp and seeds. Put pulp in preserving kettle — seeds in separate bowl. Squeeze each half after removing pulp and seeds through a strainer, adding juice to preserving kettle. Cut out the partitions and part of the white pulp from rind, adding these to seeds in bowl. Slice rind very thinly. Place this also in preserving kettle. Add the water. Let stand 24 hours. Use sufficient water from the five pints to cover the material in the bowl. Add strained liquor from bowl. Bring to boil and boil gently 1½ hours or until rind is tender. Then add sugar and boil for one-half hour or until the liquid will jell.

Note. The method of preparation of fruit as indicated in Recipe 4 is an excellent one.

LITTLE TALKS TO HOUSE KEEPERS

LAUNDERING EMBROIDERY

TO launder embroidery, make a strong suds of a pure neutral soap and tepid water and wash the articles by rubbing and squeezing them in the hands. If the embroidery is in colors do not rub the soap directly upon it. Rinse quickly in clear tepid water, roll the article in a dry towel, and squeeze until all the water is out, then shake well and roll up in a dry towel until ready for ironing, which should be almost immediately.

One should have the ironing board ready before beginning to wash the article, so as to cause no delay. Make a thick soft pad by folding up an old blanket, and cover it with fine, smooth muslin. With a hot iron rub over this muslin cover until it is so hot that the hand can not be laid upon it; place the article to be ironed upon it, face down, and cover it with a smooth dry cloth; press with a mediumly hot iron until the article is nearly dry, then remove the cloth and the article, and once more iron over the muslin pad until it is very hot, replace the article and press until dry with a medium hot iron. Turn the article over and hold the iron close to the raised parts of the embroidery to dry it out. Keeping the muslin hot on which the embroidery rests brings out the lustre.

MAKING HANDKERCHIEFS FOR BIRTHDAY PRESENTS

A dainty handkerchief edge can be made as follows:

Roll a small hem and, using mercerized embroidery cotton in some attractive color, overcast around the hem first in one direction and then in the other. The threads will then be crossed, giving a pretty effect with very little work. The stitches should be from ⅛ to 3-16 of an inch apart.

A thread may be pulled about an inch from the edge and a colored thread run in if desired. The line of color inside the overcasting makes a very attractive handkerchief. But if this thread is to be run in it should be done before the hem is put in.—

HOW TO MAKE APRON FOR TRAVELING PURSE

An apron to hold toilet articles when traveling makes a serviceable Christmas holiday gift. The first advantage of the apron lies in the fact that it can be tied on, eliminating the need of space. Its second advantage lies in the multitude and character of its pockets. This apron is merely a collection of pockets topped by a band and strings. Their arrangement and size depending on individual taste.

Crash or huck toweling is a convenient material to use because of the selvage. The bottom may be turned up the desired depth and the pockets may be made simply by machine stitching. The top may be hemmed, hemstitched, or finished with an embroidered scallop, then turned down and a tape or ribbon used as a belt. A rubber lining should be placed in the pockets designed for wash cloths, toothbrush, etc.

SALAD RECIPES FOR WINTER

THE salad has attained its permanent and popular place in the every-day and special menu largely perhaps because of its adaptability, limitless variety, and often quick and easy preparation. Here are two good recipes for winter days:

Potato salad (warm).—Five potatoes, 2 tablespoons butter, 2 tablespoons flour, 1 cup water, 2 eggs, 2 teaspoons sugar, 1 teaspoon mustard, salt and pepper, ⅓ cup vinegar. Melt the butter, add the flour and cook until bubbling; add the water, cook until smooth, remove from the fire, cool slightly and add the well beaten eggs, then the vinegar and seasonings. Return to the fire and cook until smooth and thick. Have ready sliced potatoes slightly warm, pour the warm dressing over them and mix lightly. Garnish with hard cooked eggs.

Egg and cabbage salad.—Cut the whites of three of three hard boiled eggs in small pieces, crumple the yolks with a fork or by pressing through a sieve. Have ready one and one-half cups cabbage finely, chopped, sprinkle with salt, pepper, and one teaspoon celery seed or salt. Mix the cabbage lightly with the eggs, add the dressing, tossing until well mixed. Arrange on beds of lettuce or serve in small cup-shaped cabbage leaves.

REMOVE HEAT-WASTING ASHES EVERY DAY

ASHES are heat wasters.

Cleaning the range daily saves fuel.

The ashes should be cleaned from the top of the oven every morning, leaving a very thin layer to act as a non-conducting medium and so prevent excessive heat in the oven. Close all drafts and shake the ashes out of the grate into the ash pan.

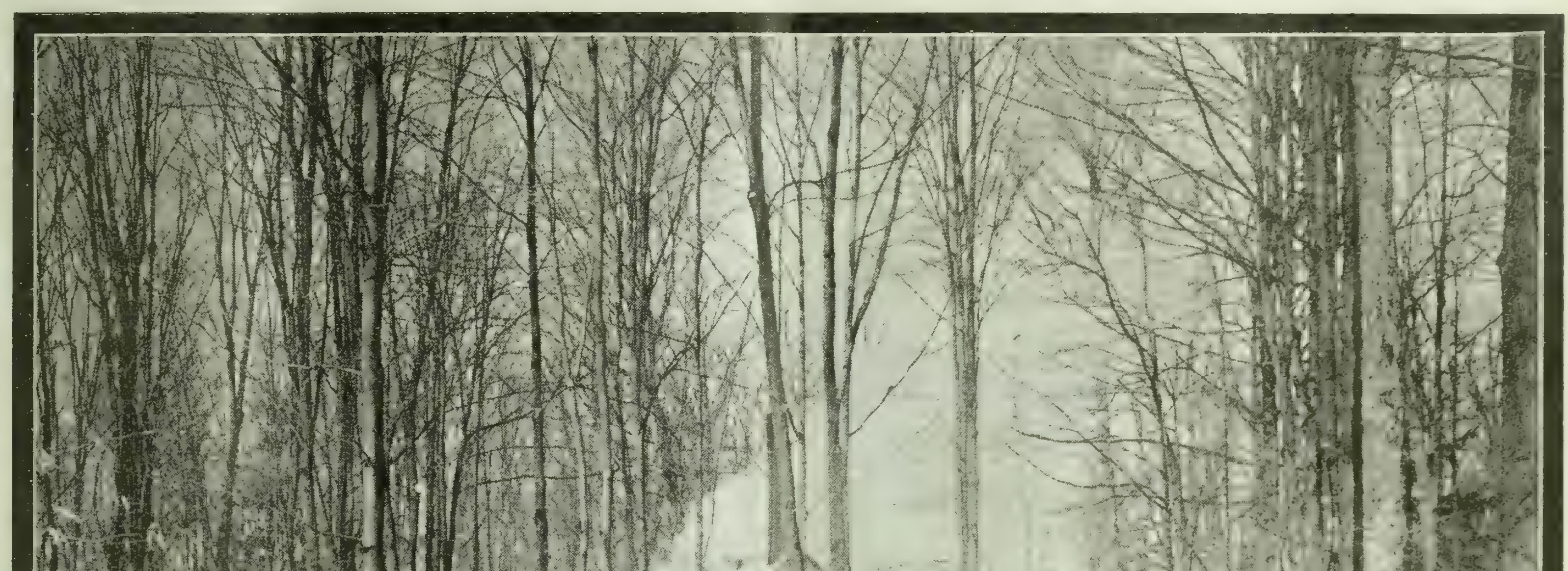
Ifthere is an ash sifter above the ash pan sift the ashes to save unburned coal, otherwise the ashes must be sifted later when they are removed. Carefully remove all ashes for if left they absorb heat and are wasteful.

Return the ash pan to its place, saving the unburned coal for use on the fire when it is burning well. Brush any remaining ashes into the ash box and remove the clinkers.

The JOURNAL of AGRICULTURE

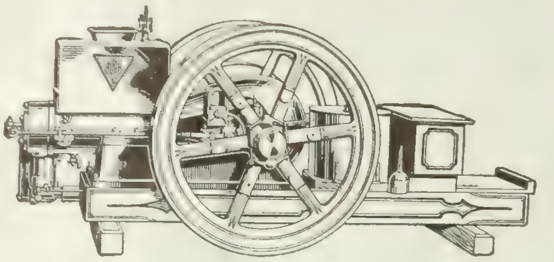
AND HORTICULTURE

Volume 18 **March 1st 1915** *Number 9*



VISITORS' DAY IN THE SUGAR CAMP AT FOSTER, QUEBEC.

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF THE PROVINCE OF QUEBEC.



Alpha Engine Facts

Alpha Engines are reliable. Use all fuels. Are easy to start. Develop full power. Are free from vibration. Have best pulley arrangement. Have simple, reliable ignition. Are thoroughly standardized and parts are interchangeable. Strictly modern in design. Are high-class in appearance. Will fit your needs for size and equipment. Make best showing when directly compared with other engines. Are sold and backed by a Company that has a world-wide reputation for selling only high-quality machines and equipment.

An ideal engine for farm use

Eleven sizes, 2 to 28 horse-power. Each furnished in stationary, semi-portable, or portable style, and with either hopper or tank cooled cylinder.

Every farmer needs an "Alpha." Send for catalogue.

DE LAVAL DAIRY SUPPLY CO., Ltd.

LARGEST MANUFACTURERS OF DAIRY SUPPLIES IN CANADA

MONTREAL PETERBORO WINNIPEG VANCOUVER

Excellent Profits from Poultry and Eggs

THOUSANDS of others have made a success of raising poultry and eggs for market—you, too, can be successful by giving a part or all of your time to it.

Right now the demand for high grade poultry and eggs in Canada and Europe is much greater than the supply. This is your opportunity.

Those who make the greatest profits are those who begin earliest. Your first step is to

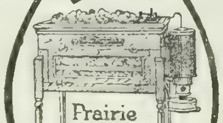
Send for our Free Book

"How to Hatch Chicks that Live"

How to Hatch Chicks that Live
Prairie State Incubators

It tells about the kind of incubators and hovers that have been endorsed by all our Canadian Agricultural Colleges—it shows how to build your own brooders at small cost—the kind of feed that produces quick, healthy growth and winter eggs, and how to obtain the experiences of successful poultry raisers.

We will help you to begin and we will pay you top prices for all the poultry and eggs that you can produce. Write today.



Prairie State incubators are best

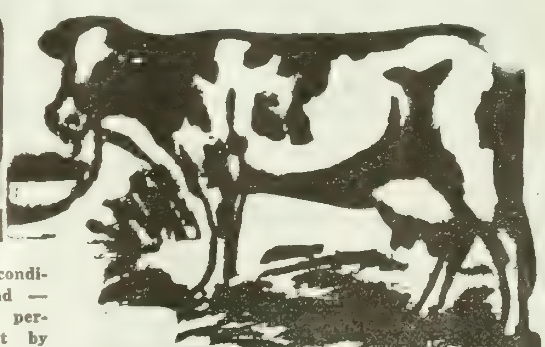
GUNN, LANGLOIS & CO. LIMITED
7 St. Vincent Street, Montreal

This Feed Costs Nothing

If you count the results it gives.

Livingston's Oil Cake is just what cows need.

It tastes good—is easily digested—keeps stock in prime condition all the year round—actually increases the percentage of Butter Fat by 16% over Pasture Grass. The richer the cream, the more money you make. Livingston's is the feed that pays for itself. 10



Write for free sample and prices. Dominion Linseed Oil Co., Limited, 31 Mill Street Montreal.

Livingston's Dairy Oil Cake

KODAK on the Farm.

AT every turn, country life offers opportunity for the camera. In a business way there are records of stock and crops and buildings and trees and ditching to be kept. From the standpoint of the family album there are pictures of the children and the pets and the home—pictures that grow in interest with every passing year.

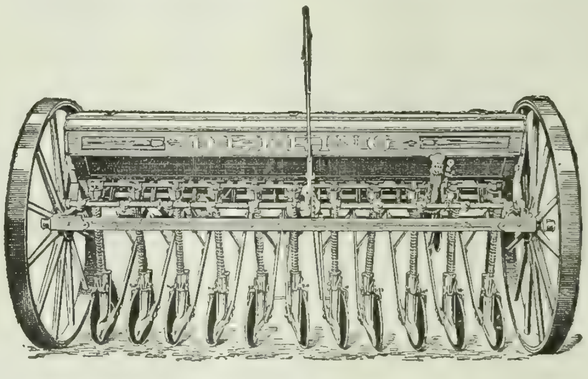
And the Kodak adds fun to every wholesome frolic. At the picnic, at every evening gathering, on the trip to the city, on the shooting and fishing trips it adds to the pleasure at the time and the resulting pictures are a pleasure for all time.

And the cost is less than you think.

Catalogue free at your dealer's, or by mail.

CANADIAN KODAK CO., Limited, 604 King St. W., Toronto.

Deering Drills



OF all the reasons for buying a drill there is none better than this. Drill planting gives bigger and better crops than any other method. Every seed has a fair chance to do its best, and no seed is wasted when a drill is used. This cannot be said of any other method of planting.

Of all the drills a farmer can buy there is none better than the **Deering** disk or hoe drill. Made in Canada, in a plant which normally gives employment to five thousand Canadian workmen—sold by a Canadian organization through Canadian implement dealers and agents, the **Deering** drill is distinctively a home product.

Compare it for strength, simplicity and good planting with any drill you know. You will find none better and few so good. When you are ready to have your spring crops planted, and want them planted right, buy a **Deering** drill from the Deering local agent. A word to him or a card to the nearest branch house will bring you catalogue and full information.

IHC MACHINES Made in Canada

International Harvester Company of Canada, Ltd

Hamilton, Ont. London, Ont. Montreal, Que.
Ottawa, Ont. Quebec, P. Q. St. John, N. B.

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 100,580
ENGLISH, 9,525
FRENCH, 91,055

Volume 18
MARCH 1st 1915
Number 9

EDITORIAL

THE NEW WAR TAXES

THE inevitable has come in the shape of war taxes. War is a costly as well as a murderous thing, and Canada is lately experiencing the truth of both statements. For the first time, we believe, in the last one hundred years, it has been found necessary to levy special taxes for the purpose of meeting the situation arising out of the war. In his recent Budget Speech the Finance Minister outlined clearly Canada's financial situation and the need for imposing special taxes on account of the shrinkage of revenue on the one hand and the equipment of the contingents on the other. It is estimated that even with the new taxes the revenues for the coming year will amount to only 150 millions, and the total expenditure to 300 millions of which 100 are for the war. It will be necessary, therefore, to borrow 150 millions to tide us over the year.

The new taxes include (1) an increase in the tariff of 5 per cent under the Preference and 7½ per cent under the regular Schedule. This increase applies to goods now on the free list, excepting anthracite coal, breeding animals, mowers, binders, harvesters, reapers and traction-ditching machines, binder twice, wheat and flour, sugar, tea, tobacco etc.; (2) special taxes on banks (1 per cent of the note circulation), insurance corporations except life, marine and fraternal insurance societies (1 per cent on the net premium income), and trust and loan companies (1 per cent of gross income); (3) taxes on railway and steamboat tickets, railway berths, and telegrams; (4) stamp taxes on all cheques deposited, depositors' receipts to banks, bills of exchange through banks, express and post office money orders, postal notes, bills of lading, letters and post cards, patent medicines and wines.

WILD WHEAT

WHEAT has been grown for several thousands of years, and it was thought hardly probable that the wild form existed. Many attempts have been made in Europe and Asia to find the wild original of wheat, but without success until recently. The reason for previous failures was that the explorers assumed that the wild original was an inconspicuous wild grass somewhat after the type of Quack grass or Slender wheatgrass, forms quite closely related botanically to wheat. This assumption was probably wrong, for it is not at all likely that our prehistoric ancestors would select an inconspicuous grass and develop it with the expectation that it would become useful for food. On the other hand, it is more probable that they selected a type for cultivation because they already found it useful for food.

Again, it is probable also that the original wheat grew in a semi-arid region, and was gradually introduced into more humid regions where it became more vigorous but less resistant to diseases. Experience shows that while wheat from dry regions thrives well in humid regions, wheat from humid regions does not thrive in dry regions.

In 1906 Aaronsohn, a botanist of Palestine, announced the discovery of wild wheat in the rocky, dry district about Mount Hermon. He has since found it growing over large areas of land too rough for agriculture, and every indication points to the conclusion that it has not escaped from cultivation, but is without doubt a wild plant.

The heads of this wild wheat are as large as those of cultivated wheat and the kernels are heavier. Its characters approach most closely to spelt and emmer.

In another respect it differs from ordinary wheat; it is cross-pollinated by the wind and under very dry weather conditions or in the absence of dew it self-pollinates like ordinary wheat.

Another important characterictic of this wild wheat is its great power of resistance to drought and disease.

The importance of this discovery from an agricultural standpoint is evident when it is known that it crosses readily with domestic races of wheat. Already steps have been taken to develop this race of wheat at Experiment Stations in Palestine, and in the Western United States under the co-operation of the U. S. Department of Agriculture. From the fact that it shows a wide range of variation and can cross freely with domestic races, it is hoped that before long new strains will be developed by crossing, which will combine resistance to drought and disease with other qualities that meet the present demand.

THE MAPLE SUGAR SEASON APPROACHES

IN planning for the production of "more than usual" the products of the maple woods should not be left out of consideration. Although maple syrup and sugar are luxuries, their production does not interfere with that of any of the staple foodstuffs. The maple harvest, unique in its season, brings in money at a time when outlay is predominant and labour is not in great demand. To harvest and market maple syrup and sugar will therefore rather contribute to than detract from the production of the greater crops by providing capital at a moment when it can be utilized to advantage. It is therefore to be hoped that the spring of 1915 will see "more than usual" activity in the sugar bush.

Some effective advertising of maple products has been done during the past year which may be expected to counteract to some extent the effects of the war in decreasing the demand for luxuries. On Dominion Day, through the enterprise of our Provincial Minister of Agriculture, samples of maple sugar and information about the products of the maple tree were distributed to the travelling public. On Christmas Day Her Royal Highness the Duchess of Connaught presented a cake of sugar to each of the Canadian soldiers in England and at the front. The new legislation prohibiting the use of the word "maple" on any but genuine goods has also served an advertising purpose, as it will no doubt lead to greater confidence on the part of the consumer of maple syrup and sugar that the goods he buys are pure and genuine.

We would commend to our readers the suggestions about marketing maple products embodied in our report of the Vermont Sugar Makers' Association. There will be a little additional income this year and hereafter to the farmer who takes the trouble to wash and dry his sugar sand. Directions for doing this will be found elsewhere in this issue.

As the sugaring season approaches the foresighted farmer will put into good working order all the apparatus of the sugar bush and will provide a good stock of dry fuel for the boiling.

PROGRESS OF CO-OPERATION IN QUEBEC

By G. A. Gigault, Deputy Minister of Agriculture

(Agricultural Gazette, Ottawa, January, 1915)

THROUGH the medium of the press and Boards of Trade Canadian farmers have been urged to increase agricultural production in the interest of producers and consumers alike. The war that is now raging in Europe will cause a decrease of production in several large countries and Canadian farmers are advised to take advantage of this opportunity and of the higher prices that are being offered for agricultural produce. It is specially reccommended that they enlarge the area in wheat, while maintaining, however, the usual area in oats. In order to follow this suggestion, the farmers must employ more help and adopt better and more productive methods. But are the farmers going to better their condition by producing more? Unless this can be shown there is little use in urging them to grow more crops. Wages of farm labourers are high and the farmers who have to pay these wages cannot make a profit unless they are able to sell their products at correspondingly high prices. This alone will encourage the "back to the farm" movement and create a liking for country life. The farmers cannot like their profession if it does not enable them to bring up their children properly and give them a good education. Country life should be more attractive than city life. Farmers should be able to live, not in luxury, but at least in comfort, in healthy and roomy houses.

To do this it will be necessary to apply co-operation to the chief agricultural industries, such as the manufacutre and sale of butter, cheese, cured

CONTENTS

EDITORIAL. — The New War Taxes; Wild Wheat; The Maple Sugar Season approaches; Progress of Co-operation in Quebec.

ORCHARD AND GARDEN. — A Word about Apples and Apple growing; The Quebec Society for the Protection of Plants; Marketing and Distribution of Fruit.

THE FARM AND FARM CROPS.—Varieties of Grain recommended by the Dominion Cerealist; Macdonald College Short Courses; Farm Weeds; Treatment against Smut; Greater and Better crops in 1915; Resolutions of Maple Syrup producers; Maple Sugar Sand; Vermont Sugar Makers' meeting; Questions about Cement; Water Supply from Creek; Co-operative Agricultural Society of the Yamaska Valley; Potash and Wood ashes.

LIVE STOCK. — Co-operative Marketing of Wool; Winter Management of Brood Sows; Annual Meeting of the Canadian Ayrshire Breeders' Association; Ayrshire Men Banquet; Visits to Ayrshire Herds; The McArthur Sale of Ayrshires; Record of Performance Test.

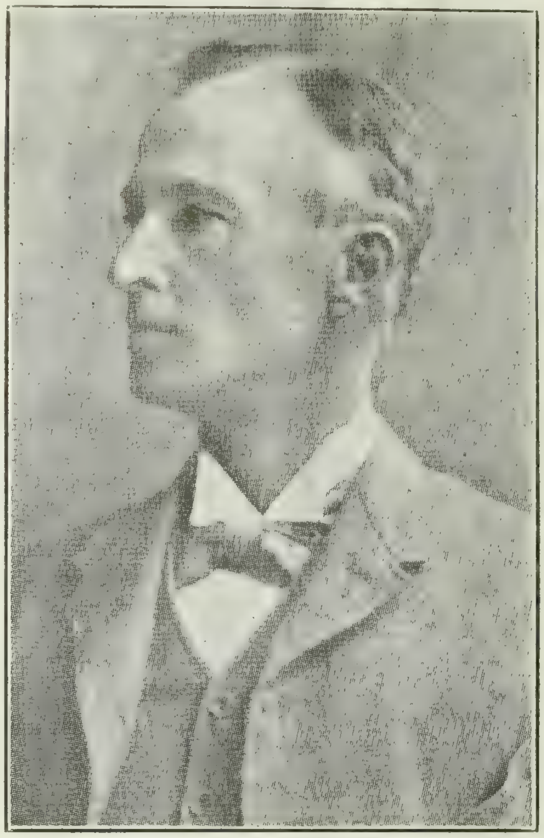
DAIRY.—Annual Convention of the Quebec Society of Dairy Industry; Cleansing Milk Cans and Bottles.

POULTRY. — Hatching Chicks in Incubators; Seasonable Poultry notes; To set a sitting hen; Breeding for Egg Production.

WOMAN'S WORLD. — The Noon Hour at School.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.



G. A. GIGAULT,
Deputy Minister of Agriculture for Quebec.

meats, the preparation and sale of canned goods, fruit, poultry, tobacco, eggs and seeds. These co-operative establishments, should be managed by experts of recognized competence, able to turn out products of a superior quality, that will sell at a higher price. Co-operation has already transformed and improved the dairy industry and it will have the same beneficial influence over other branches of agriculture. Without co-operation, agricultural progress will necessarily be slow because we will not have so many experts at our service and the spread of agricultural knowledge will be much less rapid.

In this regard we cannot too often call attention to the wonderful increase in the agricultural production of Denmark, one of the wealthiest countries in the world.

CO-OPERATION IN DENMARK

In 1881, at the beginning of the co-operative movement, the total value of the exports of Denmark was only 32,000,000 crowns. In 1909 these same exports were valued at 297,000,000 crowns. According to a Danish writer, "the co-operative societies of the country have contrived to improve the quality of the products, and for a number of years Danish farmers have sold their butter, pork and eggs for export at prices which brought them about 30,000,000 crowns per year more than they would have if they had been sold at the average price that similar products obtain in other countries.

The explanation of this development is found in the fact that the number of co-operative agricultural societies has been continually increasing in Denmark. There are now, in Denmark, 551 co-operative societies for the sale of eggs, 34 co-operative slaughter houses, 1,884 breeders' societies, 15 co-operative federations for the purchase of grain fodder, seeds and fertilizers, 6 large butter exporting societies and a large number of butter factories built with the greatest care, equipped with the most perfect equipment and managed by experts who place on the English market the best butter in the world.

CO-OPERATION IN QUEBEC

Co-operation has already produced good results in the province of Quebec. The excellent work of the Quebec Co-operative Society of Cheesemakers has been admired by everyone. This society, which was established in 1910 by 31 cheesemakers, now has over 1,200 members including more than 200 owners of butter and cheese factories. The sales reach a total of about $2,000,000. Last year the reserve fund was $5,000. This year the manager hopes to increase this by at least $8,000. Dairy products are examined by the two general inspectors of the province, Messrs. J. D. Leclair and Elie Bourbeau, and divided into three grades, which are sold separately. The maker is notified of the defect in his products; he is advised in time as to the manner in which they can be eliminated. This organisation has brought about a remarkable improvement in the quality of the products turned out by the members of the society, to such an extent that they won 20 prizes out of a total of 24 in Toronto and 8 out of 10 in Ottawa, in the butter contests.

There are also co-operatives for canned goods and tobacco that should obtain equally good results if they are as well conducted as those of the cheesemakers. Everybody admires the magnificient canned fruit put on the market this year by the co-operative of Kamouraska. This canned fruit was highly praised at the last meeting of the Quebec Pomological Society, held at the Macdonald College.

On the other hand the difficulies that are to be overcome in the conduct of these societies should not be minimized. The officers should be selected with the greatest care and the strictest supervision should be exercised. Employees and officers alike should be honest, sober and competent, and always imbued with a feeling of their responsibility.

Recently, a Commission was appointed in Ireland to inquire into the operations of co-operative societies. The Commission reported that irregular methods had crept into the administration of several societies. The State has been urged, by several witnesses, to supervise the management of these associations, in order to stop the abuses and irregularities. The necessity of an active supervision by an authority free from local influences, has been recognized by all.

But whatever these difficulties are, the agricultural community of Canada must encourage co-operation. By so doing and by watching carefully the operations of co-operative societies, it will render a great service to agriculture.

THE GARDEN AND ORCHARD

A WORD ABOUT APPLES AND APPLE-GROWING

Prof. Bunting Asks a few plain Questions, and Gives some wholesome Facts

Are you an *Apple Grower* or a *Consumer* of Apples? If you are you will be interested to know:—

That *McIntosh apples* grown in the State of Montana (over 2000 miles from Montreal) have been shipped in quantity (carload lots, November and December 1914) to Montreal and sold on our markets.

That home grown McIntosh and Fameuse apples sold during November and December for from $1.50 to over $2.00 per box and up to $5.50 per barrel, and as high as from 25 to 35c per doz. for good No. 1 apples.

That on Dec. 2rd., 1914 and later it was impossible to locate in Quebec McIntosh and Fameuse apples of No. 1 quality in carload lots or one hundred barrel-lots or even one hundred boxes of choice fruit of these varieties.

That there are many people who as yet do not know the taste of a McIntoch of Fameuse apple, even in the Province of Quebec.

That the Fameuse apple originted in the Province of Quebec and reaches its highest development in Quebec.

That the McIntosh apple originated in eastern Ontario along the St. Lawrence river and is equally adapted to Quebec.

That the McIntosh and Fameuse apples are of the highest dessert quality, in fact they are unexcelled for quality in their season (mid-October until January).

That these two varieties can be and are grown to perfection in Quebec, but we are not growing enough of them. They should be our most important varieties, and more largely planted than at present.

That we have hundreds of acres suitable for apple culture and an orchard of five to ten acres on suitable soil in a suitable location can be made very valuable, but it requires careful preparation of land, careful planting, fertilizing, cultivation, pruning, spraying, picking and marketing in order to raise a high quality crop and to obtain the best prices.

It costs *money* to grow good apples, but there is *money* in it.

Have you made arrangements to have your pruning done before spring work on the land commences?

The Spraying season will soon be here. Do you know what to spray with and when to spray? Have you obtained your materials for spraying yet?

What arrangements have you made for planting this year a young orchard of McIntosh and Fameuse as the main varieties?

We are now doing our pruning and the spraying season will soon be here. Probably we can help you, if not, you may be able to help us.

Feb., 1, 1915.

THE QUEBEC SOCIETY FOR THE PROTECTION OF PLANTS FROM INSECTS AND FUNGOUS DISEASES

An interesting Account of the Aims and Work of the Society. Mr. Chapais pleads for a more hearty Co-operation of all persons really interested in Agriculture.

During November last we (Father Leopold and myself) attended, as delegates of the Quebec Society for the Protection of Plants, the annual convention of the Ontario Entomological Society, held in Toronto. The convention was of great interest to those who attended it, and papers on the damage caused by various insects in the province of Ontario during the year were read, in addition to a short biographical notice and review of the life and works of J. H. Fabre, a renowned French naturalist, written and read in a very attractive way by Professor Lochhead, of Macdonald College, President of the Quebec Society for the Protection of Plants. The opening address of the President, Dr. C. Gordon Hewitt, was such as to arouse the interest of the members of the convention, even if only by its title: "History of Applied Entomology in the Dominion of Canada." This address was full of information of interest to all Canadian entomologists. A lecture, remarkably well illustrated with lantern views, on "The Habits of Spiders", was given by Professor Comstock, of Cornell University, Ithaca, N. Y., an article on "The Cherry-Flies" by Professor Câesar, of Guelph, Ont.; an excellent paper, equally interesting from an entomological viewpoint and attractive through the original style of the writer, entitled "Mountains and Hills", by the Rev. Dr. Fyles, of Ottawa; an article of especial usefulness on the "Insect Enemies of Forest and Ornamental Trees", by Mr. J. M. Swaine, of Ottawa; and many other papers on the programme made up one of the best conventions ever held.

For us, the most interesting papers presented were two giving the latest information on the Army-Worm caterpillar which caused so much damage last summer in the province of Ontario and in a few counties of the province of Quebec. The damage caused to crops by that insect in the Dominion of Canada last year was estimated at $300,000.

After attending this convention we came back with a deep conviction of the great usefulness of societies of this kind, and the great debt of gratitude we owe to the men who devote their lives to searching into the secrets of science for the benefit of their fellow-citizens. Agriculture, in all its branches, finds itself every day obliged to refer to those scientists for help to wage war against the innumerable parasites which infest their fields, orchards, gardens and animals. The farmer has to fight incessantly against those enemies, formidable alike by their numbers and by the damage they cause, and if he were deprived of the help of these well-informed societies he would be unarmed in his struggle.

Though many farmers are convinced, as we ourselves are, of the advantages which come through the efforts of these societies, we regret to note how little interest they take in them, notwithstanding the fact that they owe them so much. In the province of Quebec we have societies similar to those referred to above, but how small is the number of their members. We have, amongst others, the one whose name appears as the title of this article: "The Quebec Society for the Protection of Plants". Though it is not, properly speaking, an entomological society, it offers a wide field to the scientific investigations of its members, owing to the fact that it embraces not only the study of insects but also that of the fungous and parasitic diseases affecting plants, and of the weeds that prevail on so many of the farms of this province.

This Society is still young. It is only six years old, having been organized in the year 1908 and its first meeting held at Macdonald College on June 24th of that year. Its first officers were Mr. W. Lochhead, Professor of Biology, Macdonald College, President; Mr. Auguste Dupuis, Director of the Quebec Experiment Fruit Stations and a well-known nurseryman, Village des Aulnaies, L'Islet Co., P. Q., Vice-President; and Mr. Douglas Weir, B. S. A., Assistant in Biology, Macdonald College, Secretary-Treasurer. Thirty-six members were registered for the first year. They were gathered from eleven counties in Quebec, one from Ontario and one from the United States. The Society receives from the Quebec Government an annual grant of $250.00. It publishes a yearly report containing the proceedings of its semi-annual meetings—a summer outing and a winter convention—and the various papers read and lectures delivered before the Society. A small sum is paid every year for various investigations carried along the lines of insect pests and fungous diseases.

In perusing the six reports of the Society already published we find that it has to its credit much good work done concerning various insects, diseases, fungi, weeds and remedies against all plant enemies and pests. These six reports contain thirty-nine papers on noxious and useful insects, ten papers on various plant diseases, five papers on weeds, twenty-five on fungi and bacteria, and five special papers on remedies against insects, diseases, weeds, fungi and bacteria in addition to those indicated in the papers on the various insects, diseases and pests, and in the spray calendars also published in those reports.

The following are the names of the writers of these papers:— Messrs J. M. Swaine, W. Lochhead, Douglas Weir, Albert F. Winn, Rev. Dr. T. W. Fyles, F. C. Harrison, Leonard Klinck, G. Dimitriou, J. Vanderleck, H. S. Hammond, Rev. Dr. Robert Campbell, H. T. Güssow, J. F. Monroe, G. M. Williams, W. M. Brittain, J. W. Eastham, Arthur Gibson, W. P. Fraser, P. J. Bryce, F. M. Clement, J. S. Dash, F. W. L. Sladen, W. A. McCubbin, Brother Victorin, Rev. Father Leopold, J. C. Chapais, E. M. DuPorte, G. Beaulieu, I. J. Beaulne, W. Sadler, F. E. Lloyd.

The Society has undertaken the publication of a list of the insects of the Province of Quebec. One part of 163 pages, dealing with Lepidoptera (Butterflies and Moths) prepared by Mr. Albert F. Winn, was published in the year 1913 and others will soon follow.

It has also been suggested by the Society that the time is now ripe to publish a new Flora of the province of Quebec to take the place of "La Flore Canadienne" written by Abbé Provencher, which, taking into consideration the numerous botanical discoveries made by our modern botanists, is now incomplete. The Quebec Society for the Protection of plants is ready to undertake such a task, should it be encouraged to do so.

If we have spoken rather at length and in detail of the work accomplished by the Quebec Society for the Protection of Plants, it is to incite lovers of natural history in our province to enlist among its members. The Society has now a list of 78 members, 16 in Ontario, 2 in Saskatchewan, 4 in Nova Scotia, one in British Columbia, one in the West Indies, one in the United States and 55 in 12 counties of the province of Quebec. On a little reflection the conviction is reached that in our province of Quebec there are more than 55 persons who should become members of the Quebec Society for the Protection of Plants. It is our opinion that all the professors and students of our three agricultural schools, the professors of science in our classical colleges, the professors of our normal schools, and agricultural lecturers should become members of the Society. They should, by their researches, studies and papers, contribute to the subject-matter of its reports to be distributed to the public, for the dissemination of natural history knowledge, more especially of information in botany and entomology, and to put an end to the indifference prevalent among our agricultural community to our scientific societies. That community is in urgent need of these societies to guide them in the war it has perpetually to wage against the enemies met with in all branches of agriculture, and from which it derives the profits which help to increase the prosperity of the province of Quebec.

The Quebec Society for the Protection of Plants usually holds the more important of its two semi-annual meetings at Macdonald College during March, and this would be a good occasion for those wishing to enroll as members to send their applications to this effect either to Professor Lochhead, Macdonald College, President, or to Mr. J. M. Swaine, Department of Agriculture, Ottawa, Secretary of the Society. Such application does not bind the sender to the payment of an entry fee or any subsequent annual subscription.

J. C. CHAPAIS,

St-Denis-en-bas

MARKETING AND DISTRIBUTION OF FRUIT

By C. W. Baxter, Chief Fruit Inspector for Eastern Ontario and Quebec

(An address delivered at the Quebec Pomological Society Meeting, Dec. 1914)

THE growing of small fruits in eastern Canada in a commercial way being confined to a few districts, and although grown in various districts to some extent, the production has not yet reached the stage where the demand has not been equal to the supply at remunerative prices to the producer. Consequently, in the preparation of this brief paper the greater consideration has been given to the marketing and distribution of the apple.

It is doubtful if there is any product of the soil which has reached such a point of value and which shows so great a lack in practical business methods of marketing and distribution as the apple.

Many growers seem to think that the apple business is a business peculiar to itself and unlike any other business. This of course is true to some extent, but to no greater extent than various other lines of business differ from the apple. However, there are certain business principles which must be followed, which are essential to the success of every business. The same principles are practical in creating a demand, selling and distributing the apple as are used in the distribution of the product of any factory.

There is no fruit which offers more speculative inducements than the apple; in fact, it has reached the stage of being termed by some a "gamble".

To speculate with bananas is practically an impossibility, as is also the case with oranges, each of these being controlled by a selling and distributing organization, and it is a well known fact to apple growers that in these two fruits the apple meets its greatest competition. The fact that no speculation is permitted in bananas and oranges, the various advertising schemes which have been used, the machinery employed for the proper estimating of the total crop enabling the selling force to so determine the price, have created a tremendous increase in the consumption of these fruits, even to the extent of moving the whole crop with little or no waste.

This last factor, the elimination of waste product, is one which is now commanding the attention of all students of economy. Those of us whose privilege it has been to move about the apple growing districts of eastern Canada during and after harvest time, and view the piles of "culls" left in the orchards, are convinced that this feature of the apple industry should be seriously considered by the producers.

Scientific men tell us that it costs the tree as much to produce a cull as it does a No. 1 apple; and we are reminded that the waste we see in the product of the tree is also a waste of the productive element of the soil. With the aid that is now given, and the various demonstrations being conducted throughout the producing districts, it has been proved conclusively that with the adoption of proper spraying, cultivation, pruning, and thinning methods this great waste can be largely eliminated. Commercial orchards in British Columbia and the Pacific Coast States have produced for several years in succession from 90 to 94% No. 1 fruit.

The tremendous success of the marketing organization of the orange growers of California is well known to us all; in fact we are constantly being reminded of this by the display of oranges in stores, large and small, in the cities and towns from coast to coast, even in very out-of-the-way places. The success of the co-operative organizations of the California orange growers, the unsatisfactory returns to individual apple growers, and ruinous competitive methods of associations marketing year after year induced the growers of the Pacific Coast States to form the co-operative selling and distributing organization known as the North Pacific Fruit Distributors, a selling machine absolutely owned, controlled and managed by the growers.

It has been said that necessity is the mother of invention; I believe it has been largely so with the fruit grower of the western coast States, who realized the fact that, being situated so far distant from the larger marketing centres and the great disadvantage in freight rates, it would be impossible to compete successfully with the eastern fruit grower with the same product put up in the same way.

The methods employed by these growers in production from the first were of the most up-to-date character; and the result was that a very large percentage of fruit was clean, well coloured and of first quality. They then adopted the box as the package to be used in marketing the apple. This package, although not new, was nevertheless unpopular at that time, but has since become practically a standard package and greatly desired by the trade.

Co-operative associations were formed, and during the time the greater number of young orchards were coming into bearing and the total product was not large very high prices were realized. However, in 1912 the growers found themselves with a very large crop of apples; in fact, by far the largest. To market this was a big problem, and various methods were used. Co-operative associations were competing one with the other; members withdrew from associations to which they belonged and tried to market their fruit individually, all of which resulted in most unsatisfactory returns and in many cases ruinous prices. Growers at once set about to find means to remedy this condition, the result being that over 60% of the growers agreed to co-operative marketing through a central association.

In the formation of this co-operative selling organization, men of the highest degree of efficiency and business management only were engaged, men in whom they had perfect confidence, based on their business efficiency, men who had already made records for successful business. Wherever we go we see evidences of the success of this organization, who have justly claimed for themselves to be "the greatest individual distributor", "the most perfectly equipped selling machine in the deciduous fruit business of the world".

No greater evidence of this successful system of distribution can be found than by the invasion of our eastern markets in the spring months of such varieties as the Missouri Pippin, Winesap and the much despised Ben Davis. These we find on the tables of our eastern hotels, dining cars, and sold by railway news agents and fruit dealers at often fabulous prices.

The claim of this organization that the grower is permitted to see the whole history of his fruit from orchard to market is made possible by the uniting of the local co-operative associations in a sub-central organization governed by the growers directly, or through representatives of the locals. A trustee is elected by each sub-central who constitutes the governing board of the central. The growers of each district also elect two of their number who together constitute an auxiliary board with power to review the acts of the trustees. The books and records of all branches—Central, Sub-central and Local are open to the inspection of each grower at all times, which permits of his knowing the cost of every move.

This organization provides a system of gathering crop estimates and market reports, and furnishes the grower with more and better information than is known by the buyers, which is a tremendous advantage to the grower. It insures a uniform, supervised and dependable pack upon which buyers can rely, which is a great factor in eliminating the speculative element.

With representatives in every fruit centre in America and Europe, the fruit is more evenly distributed and secures a wide distribution. The buyers are assured of a greater steadiness of price and an almost certainty of buying on a stationary or a rising, not declining market—another factor in eliminating the speculative element.

It also makes possible the wide and intelligent advertising of their product which increases the demand. It is true this organization has not been in existence very long, but it has accomplished much, and founded as it is upon ideal business principles, cannot fail so long as it receives the loyal and sympathetic support of its members. The working of this organization (a mutual non-profit corporation), or any other system which gives the grower large and small control of his fruit from production to a wide range of markets, should receive the serious consideration of every fruit grower. Therefore, the solution of many of the marketing and distributing problems of the apple grower have been obtained through intelligent and systematic organizations, founded on business principles and conducted on business methods.

The great success attained by the United Fruit Companies of Nova Scotia, which is the buying and marketing machinery of a large number of local associations, is another excellent example of what can be done by organization, and the manner in which the phenomenal crop of 1911 was marketed and distributed was a credit to the officers and members. A number of local associations of the Okanagan Valley, B.C. have organized a central body known as the Okanagan United Growers, Limited, which has given good results.

As we review the methods of marketing and distribution in the Province of Ontario and Quebec to-day, we find they are various indeed. First, the producer packs his fruit and awaits the arrival of a buyer. Should he be disappointed in this he sells through the commission merchant. Second, the producer, as has been his custom for years, receives an amount per barrel in advance and ships his fruit to the European markets on consignment. Third, the producer sells his fruit by the barrel, picked, the buyer doing the packing, or the producer sells the fruit by the barrel on the tree, the buyer picking and packing the fruit. Fourth, the producer sells his fruit by the "lump" and secures the price for all the fruit in the orchard. Fifth, local co-operative associations whose members pack their own fruit and sell through mail quotations or by the employment of one or two travelling salesmen. We cannot but admit that such methods offer a large field of speculation. Some individual growers who have established a reputation for high quality in local markets, experience no difficulty in making sales at highest prevailing market prices. These growers, however, are comparatively few.

Co-operative associations which have a reputation for uniformity of grades and high class fruit, undoubtedly have been given a preference by dealers in our western markets. This was clearly

THE FARM AND FARM CROPS

VARIETIES OF GRAIN RECOMMENDED BY THE DOMINION CEREALIST

IT is not the policy of the Experimental Farms to advise the cultivation of new varieties of grain which have not yet been sufficiently tested in Canada or which when tried have shown no superiority over older and better-known sorts.

The varieties here recommended have been thoroughly tested and have shown excellent qualities. While they may not be adapted to every condition of soil and climate, most of them have already demonstrated their suitability for the provinces for which they are recommended.

Other very good sorts, almost or quite equal to those mentioned, could have been added to the list, but it appears undesirable to recommend an unnecessarily large number of varieties.

QUEBEC AND ONTARIO

Spring Wheat.—Red Fife and White Fife are good standard sorts but rather late in ripening for northern localities.

Huron, Marquis and Early Red Fife are earlier in ripening.

---

evidenced in the marketing of the big crop of 1912. Dealers frequently paid from 50c. to $1.00 per barrel more for packs of associations which were well known, in preference to unknown individual packs where the fruit was equally as good. Because of the various methods by which the fruit is sold and packed, a very wide range of grades and quality is the result. There is absolutely no uniformity even though the fruit complies with the requirements of the Inspection and Sale Act. With few exceptions this lack of uniformity in grades is as prominent in association packs as with individual packs and causes no small amount of dissatisfaction to the dealers. Instances of this have frequently come to the attention of the speaker. I have seen barrels of apples packed by the same association exhibited in large quantities and offered for sale in the stores of two merchants doing business in the same block. The varieties were the same as well as the price, but one lot was worth at least a dollar per barrel more than the other although both were within the requirements of the Act. I am persuaded that there is no feature of the fruit industry that will give greater satisfaction to the distributor and consumer, as well as better returns to the producer, than the establishing of uniformity in quality and grades.

Another result of our various and unorganized methods of marketing is the wide range of prices received by the producers even where the quality and variety are equal. It is not the fault of the producer but of the system.

It is not to be expected that the grower is thoroughly posted with regard to actual market conditions. He may be an expert in production, but this very fact prevents him from obtaining this information. The expense necessary to obtain this information would be out of all proportion to the value of his crop and he is placed at a decided disadvantage when he comes to market his fruit.

If the buyer whose special business it is to follow the markets, succeeds in buying below the prevailing market price, the difference is a loss to the grower and this difference frequently represents a fat profit. Transactions of this kind are very unsatisfactory and discouraging to the grower and he frequently makes use of the public press to give vent to his dissatisfaction and the blame is usually placed on the so-called "middleman" known to the public as the retailer. We had an example of this during the fall of 1912. A grower in Ontario placed a card in a barrel of apples upon which he had written: "I received 50c. for this barrel of apples. What did you give for it?" This barrel of apples was shipped to Winnipeg and the consumer replied that he paid $5.50 for it. This incident was recorded in the newspapers in Winnipeg and started a controversy which was taken up by newspapers from coast to coast. Growers and dealers in the east endeavoured to place the blame on the western dealers, both wholesale and retail, until the responsibility was finally placed upon the retailer who was branded as an "extortioner". It is not necessary to go further into the details of this incident for I have no doubt you will recall it. However, there are two points which might be of interest to you. First, that the individual grower claimed to have received only 50c. per barrel for his fruit, while numbers of organized co-operative associations received from $1.25 to $1.95 net per barrel for their fruit sold on the same market. (Prices quoted are, of course, for unpacked fruit only). Second, the custom which has become an annual affair of abusing the distributor whom producers are compelled to use to market their product. In all the public discussions and controversies on the question of high cost of living, and the great difference between the price paid to the producer and the price paid by the consumer, it usually terminates with the responsibility being placed upon the retailer. Is this public condemnation of the retailer justified, and does the producer gain anything by it? I am sure that we are all agreed that such a policy is contrary to all present day business methods. Large corporations and manufacturers do everything possible to gain the sympathetic co-operation of the distributor who handles his goods, at the same time retaining the control of distribution and to a great extent the price. They make a special study of the trade requirements and endeavour to please, knowing the value of a satisfied customer in creating a greater demand for their product.

Is the retailer's profit on apples excessive, and does he control the situation in the matter of increased consumption? I am convinced that in too many cases the profit on apples is exorbitant and much in excess of many articles which the retailer sells, and under our present system they control the situation to a great extent.

Apple growers in general have devoted all their time to production and few have studied our market conditions; they are unorganized and have done nothing to create a demand or increase consumption. If we can increase the demand and obtain better distribution we can secure better prices. Although we are convinced of the excessive profits frequently made on apples, we are also convinced that the net profit of the retailer (with special reference to the grocer) is anything but great. In fact, the net profit is less than on most lines of business which requires so much hard work. And the question here presents itself—does the apple grower contribute to the cost of selling other products? If it costs the retailer, for example, 18% to do business and he is selling lines on which he, through organized efforts of manufacturers and keen competition, is compelled to sell on a 7 or 10% advance, the difference must be made up on other goods, and I believe all too frequently the profits on apples *do* contribute to this deficiency. It is not the fault of the retailer but of the system, and the remedy undoubtedly is in the hands of the grower.

Another very important feature in connection with the retail end of the apple selling is the question of waste. The waste is altogether too great and the retailer must protect himself against this.

Whether the fruit has been sold f.o.b. cars or in the orchard unpacked, the distributor must take all chances against waste, and owing to the very careless methods of handling the fruit in picking and packing, the waste is enormous. The practice of picking and packing a few windfalls, which at the time appear to be undamaged, with hand-picked fruit, which in winter varieties is bound to fall down in a short time, is responsible for a portion of this waste. Over-pressing is another reason for this waste; in fact I am satisfied that this is responsible for three quarters of it. In the course of our inspection work we frequently find long keeping varieties with apples split open, one third down in the barrel. Just so long as this condition of packing exists just so long will the retailer provide for this waste.

We have mentioned some of the evils of the industry from point of production to the consumer, and can only conclude that the fault does not lie with the producer nor yet with the distributor, but with the system, and the remedy for most of these evils is in the hands of the grower, not the individual grower, but by organized efforts only. I am sure it is the desire of every grower to have control of his fruit, as it is the desire of every manufacturer to control his product and to receive a just return for his labours.

As previously stated, a number of the evils of the marketing and distribution of the fruit of growers in Nova Scotia and in the Pacific Coast States have been overcome by the organization of a central body, and I am sure the same business methods applied to the industry here in the east would bring about similar results. However, in order to obtain this, growers must first organize into local associations.

A central selling organization of the fruit growers of the Province of Quebec may seem to be impracticable, but local conditions are excellent for local organization, and if this were done a central body would surely follow. We are all aware that in British Columbia there are certain varieties which grow better than anywhere else, likewise in Ontario and the Maritime Provinces, and it is also an acknowledged fact that nowhere can the famous McIntosh Red and Fameuse be grown as well as in the Province of Quebec and eastern Ontario.

These two varieties, admittedly the best of all dessert varieties, are of the highest commercial value. Has the grower of these varieties received a fair share of the price paid by the consumer? Compare the price the consumer is paying to-day for these varieties, with the price the grower received; did the grower receive his just share of the profits? Some may advance as a reason for this the unsettled state of the markets but so far as these varieties are concerned, this year does not differ from any other, for the reason that the supply has not been equal to the demand at the prevailing prices of other good varieties, and the consumer is prepared to pay a higher price.

There are a great many details in connection with this great question of marketing and distribution that time will not permit me to deal with, but I am sure that the growers are fully aware that it is to the consumer they must ultimately look to obtain a greater consumption, not directly, perhaps, but through the already established trade channels, the wholesaler and the retailer. Organization has not yet overcome all the evils of the marketing and distribution of fruit, but we have excellent examples of the great advantages it has over individual efforts. Therefore, in our review of the evils and disadvantage of our present system, we are satisfied that the solving of these problems is too great a task to be accomplished by the individual grower, and the only remedy is through systematic co-operation and the adoption of 20th century business methods, which will give the grower control of his fruit from orchard to market and a more equitable division of the profits.

All the varieties mentioned are good for bread-making, but Huron is not equal in this respect to the others. It is however, particularly vigorous and productive and is highly recommended.

In extreme northern districts, Prelude will be found valuable if the soil is fairly rich and the rainfall sufficient.

In southern Ontario, the very late variety, Blue Stem, gives good results. It is rather more resistant to drought than most sorts. Goose wheat is useful in extremely dry localities, though the price of this variety is often quite low, as it is not used for bread-making. Kubanka, closely resembling Goose, makes excellent bread, but it is so different from ordinary wheats that millers object to grinding it. Goose is usually more productive than Kubanka.

Oats.—Banner and Abundance are two of the best sorts. Ligowo is slightly earlier in ripening. Daubeney and Eighty Day may be used where extreme earliness is desired.

Barley.—Manchurian and Ontario Agricultural College No. 21 are recommended among the six-row sorts.

Duckbill, Canadian Thorpe and the best strains of Chevalier are recommended among the two-row sorts.

No varieties of beardless or hulless barley can be recommended. Success (beardless) is of very early ripening habit.

Peas.—Among yellow peas, Arthur is most highly recommended for earliness and productiveness. Golden Vine, Chancellor and White Marrowfat are also good sorts.

Prussian Blue, Wisconsin Blue and English Grey are good coloured peas.

MACDONALD COLLEGE SHORT COURSES IN LIVE STOCK, FIELD CROPS, HORTICULTURE AND POULTRY

(By our special reporter. Continued from February issue)

IN our last number we gave an account of the general plan of the Short Courses which were arranged by Macdonald College during the early part of January. We also summarised a few of the lectures given by some of the members of the staff at various places. To-day we will continue this interesting series of condensed reports of the lectures.

MORE WINTER EGGS

was the topic discussed by Mr. M. A. JULL, manager of the Poultry Department at Macdonald College.

"There is good money in poultry raising," said Mr. Jull, "but it takes a good man to get it out. Above all, good stock is the first essential, and then good management is necessary to make money in winter egg production. General lack of interest in poultry keeping among farmers, careless methods in handling the flocks and wasteful methods in marketing the produce are chiefly responsible for the millions of dollars which the farmers of Quebec are losing. Disease, due to unsanitary conditions, is also prevalent.

"There are too few fowls on the average farm, and the average number of eggs laid is too low. The flocks should be increased from 60 to 100 and the average egg production per bird, through careful breeding and rational feeding, should and could be increased from 75 or 80, as at present, to at least 100 eggs per year. If these two factors were accomplished at once Quebec farmers would save for themselves over $15,000,000. Quebec produces at present about $8,000,000 worth of poultry products in one year, and also imports about $8,000,000 worth of eggs and dressed poultry. That is a terrible situation for an agricultural province, and it is largely the farmers who are responsible.

"A farm flock is certainly a profitable source of income, and under good care a flock of 100 birds should bring in a revenue of from $200 to $300. Considering the small amount of investment, along with the fact that returns are regular and also that comparatively little labour, and this not heavy, is required, everybody must agree that poultry keeping is one of the most profitable branches of the farming industry.

"The main object should be to secure eggs when prices are highest. This means that the pullets should commence laying by about the 1st of November. For this purpose they must be in good laying condition at that time, well developed and fully matured. In order to get this kind of pullets we must breed from good, early laying stock and give special attention to the early hatching of the chicks and the proper and steady development of the growing pullets. Selection is of great importance, and vigour and vitality should never be out of the farmer's sight. Two year old hens are usually unprofitable.

"Next to careful breeding and vigorous selection, good housing and proper feeding are important factors in the production of winter eggs. And we should always remember that the more eggs secured in winter the larger the profits. The house should be dry, it should provide the fowls with plenty of fresh air, should be free from draughts, be sanitary, economical and convenient. The hen must be kept in comfort to lay in winter. Plans and specifications of good types of poultry houses may be secured by writing to the Poultry Department of Macdonald College.

Feed the hen good wholesome food and give her as much variety as possible,—and then *make her work for her living.* A lazy hen will not lay. Keep the hens busy, and they will keep in good health. Wheat and corn are two of the best winter foods. Part of the whole grain ration can be made up of oats and buckwheat. The oats may be rolled out flat and fed in hoppers but these should be closed in the morning. Wet mash will probably get a few more eggs than dry mash, but it should be fed in limited quantities. Mangels are excellent for green food. Beef scraps, green bone and sour skim milk are the best animal foods. Oyster shell, for egg shells, and grit for the gizzard should not be forgotten."

On one occasion Mr. Jull, whose speeches were very much appreciated by his audiences, ended up by saying: "The hen that works hard is the hen that lays hard, and the hen that lays is the hen that pays".

IN HIS LECTURE ON "GRAIN GROWING IN QUEBEC".

Mr. L. C. RAYMOND of the Cereal Husbandry Department, enumerated the most prominent varieties of small grains best suited for Quebec conditions. He recommended Daubeney and Alasks as early oat varieties, and Banner for localities where early ripening is not the vital question. Red Fife was mentioned as the best wheat and Mensury as the best barley variety. Among fall sown cereals "Winter Rye" takes the first place for hardiness and yield, and this grain is to be highly recommended from a number of standpoints.

The use of ordinary "Western Grain" for seed was strongly disapproved by the speaker, who presented some very interesting figures illustrating the low percentage of germination and high percentage of weeds and dirt in this kind of grain. "Homegrown seed gives better satisfaction," said Mr. Raymond, "and our fields would give a better and higher yield if the farmers generally adopted the method of selecting and multiplying good typical heads for seed of the variety in question. Seed improvement, together with a thorough cleaning and grading on such fanners as the "Clipper" or other machines built on the same good principles, would go a long way to improve grain growing conditions.

"The man who is growing grain for feed will probably obtain higher yields by seeding Mensury barley, 1½ bush, per acre, mixed with Daubeney oats, 1 bush. per acre, than by using any other grains singly or in different combinations. Early seeding is generally to be preferred to late seeding, especially for wheat and oats; and drilling, particularly as regards wheat and peas, will result in better and more uniform germination than will broadcasting.

GRASSES, CLOVERS AND ALFALFAS

In the course of his talk on "Grasses, Clovers and Alfalfa" Mr. Raymond emphasised the fact that contrary to the common conception there is just as much variation among these plants as is for instance to be found in our ordinary grains. Some are hardy, some are not; some are better adapted for hay while others lend themselves better to be used for pasture. Generally speaking, Orchard Grass and Tall Oats are early maturing grasses and as such are more suitable for mixing with alfalfa than other grasses. This mixture is particularly good for early soiling and gives a high yield.

Alsike clover was recommended for low lying sections, and it might on the whole be considered a wise practice to include this hardy clover variety in most mixtures, except on high dry land.

Mr. Raymond has made a special study of seed production from clover and alfalfa. During his discussion of this topic he pointed out, among other things, that the second crop of these plants gives a better seed yield than the first crop. In both cases the first crop should be cut comparatively early, clover not later than the 25th of June.

MARKET LAMBS AND WOOL

Mr. A. A. MacMILLAN, in charge of Sheep Husbandry, dealt with "The Possibilities of Sheep Raising, especially in connection with the raising of Lambs for Market and the Sale of Wool. "Mr. MacMillan's address appears in full elsewhere in this issue.

Mr. MacMillan is steadily gaining a good reputation in the Province as an expert in the sheep line, and he can always be sure of a good hearing at Farmers' Meeting. In some parts his demonstration and organization work has already brought about a marked change for the better.

THE FARMER'S GARDEN

The farmer's garden is a negligible, quantity in our province, and in Canada as a whole for that matter. Both Mr. A. H. MacLENNAN and Mr. A. GORHAM of the Horticultural Department spoke at different occasions in denunciation of this deplorable fact.

"It seems strange," said Mr. Gorham, "that a good supply of fresh vegetables and small fruits should be a luxury on the average farm. Yet it is true that few farmers take the trouble, or I should say the pleasure, of planning a small garden and giving it a little care so that the luscious strawberry and raspberry, and fresh asparagus, lettuce, radish and other vegetables might be on their table during the whole growing season. It has been estimated that a garden 100' x 150' will, if properly managed, supply enough vegetables, with the exception of potatoes, for a family of five persons. It is surprising what quantities may be grown on such a small area. Several crops of lettuce and radish can be obtained. By making sowings about a week apart a good fresh supply will always be on hand."

Both speakers recommended laying out the garden close to the house, to be easy of access to the house wife and conveniently near for weeding, etc. A southern or a south-eastern exposure is preferable, as this is likely to be the warmest. The land should be given plenty of plant food thorough tillage and good cultivation during the season, and if the vegetables are planted with sufficient distance between the rows the main work of keeping it clean and creating a mulch can be done with horse power.

As some of the crops, such as raspberries and other small fruits, rhubarb, asparagus, etc. are to remain in the same place a number of years it is advisable to plant them at one side of the garden where they would not be interfered with during ordinary fall and spring operations.

In transplanting plants of any kind one should always be careful to let the ball of earth remain with the roots of the young plants so that they will not suffer a check. The Journal hopes soon to be able to present to its readers specific articles on vegetable growing from the hands of Mr Gorham and Mr. MacLennan, who is an expert on tomato culture, among other things.

LIVESTOCK IMPROVEMENT.

was the topic which was given consideration by Mr. A. NESS, of the Animal Husbandry Department, during the second week of the short course, at the meetings held in the counties of Huntingdon and Richmond.

As this subject is in itself rather large, and as most of the towns in which the meetings were held are located in good dairy sections, the discussion followed more particularly along the lines of improving the dairy stock. In one place, however, the greater part of the lecture had special reference to horse breeding. Mr. Ness is a worthy scion of the well known Howick family, and the various audiences appreciated greatly his sound practical talks and advice on the breeding and improvement of live stock. The speaker referred more especially to the necessity of raising the standard of the stock kept on each individual farm. Emphasis was laid on, first, better breeding including careful choice in the mating of animals, and second, more thorough selection and better development of the young stock. It is not necessary that every man work with registered stock, and there are, it was pointed out, many profitable herds to-day whose females are not eligible for registration. Yet, for a given amount of money, the introduction and use of good breeding registered sires together with a rigid selection of the young stock will accomplish more in the way of improvement than will any other system. "There are" said Mr. Ness. "too many small, common, plain looking individuals both males and females, in the average herds. If these were culled out and their share of feed and attention given to the better animals the standard would rise by leaps and bounds. Too much of our young stock is not given the proper chance of developing into the kind of animals that are wanted, simply because they do not receive the proper kind of feed".

ROOTS AND CORN

Mr. P. A. BOVING, who is in charge of Root Crop Investigation at Macdonald College, lectured on Hoed Crops and Root Seed Production, incidentally dealing with Soil Management in connection with his discussions on these crops.

"Under present conditions", said Mr. Boving, "the economic limit for the acreage to be planted with roots on the average farm will be reached sooner in Canada than in countries with lower wages. Otherwise nothing could prevent roots from becoming the most important crop in the majority of dairy districts, outside of the corn districts of Ontario. According to experiments at the College and in the province roots if grown in the right way outyield our ordinary farm crops; and counting an expenditure of $40.00 per acre mangels and swedes, for the last five years and from fields exceeding ten acres, have been placed in the root cellar of the Macdonald College farm at a cost of slightly less than $1.50 per ton. This means that we have been able to feed our cows with one pound of grain value that cost us only $1\frac{3}{4}$ cent".

During his lectures Mr. Boving laid particular stress upon the fact that the feeding value of roots when fed in quantities of more than 15 lbs. per cow per day, depends on their content of dry matter. Under average conditions, therefore, 10 lbs. of mangels, carrots or swedes, or 12.5 lbs. of turnips (soft white) contain one pound of dry matter and have the same feeding value as one pound of grain. In order to obtain a big root crop—a small root crop is always expensive—the farmer should plow twice in the fall, work his land well, harrow early in the spring, supply sufficient plant food with stable manure and fertilizers, seed early, use plenty of seed, single the plants in proper time and cultivate repeatedly during the season.

Corn must naturally occupy the greater part of the hoed crop field, and a silo filled with good well-matured silage is as good as a well filled bank account. Early maturing varieties such as Early Leaming and Wisconsin No. 7 among the dents, and Longfellow, North Dakota and King Phillip among the flint corns, were recommended. A strong plea was made for the purchase of corn on the cob and for the leaving of sufficient space for the plants in the field.

In connection with root seed production it was pointed out that home grown seed gives better satisfaction in all directions than the ordinary market seed, and that seed can easily be grown in our province, as proved in many instances. Over and over again it was repeated that "25 to 30 well developed good roots of any kind, planted down to the neck in rich soil, will give seed enough for one acre of roots the following year".

At different places we had occasion to speak to the farmers in private after the meetings and they all expressed general satisfaction with this extension work of the Macdonald College. Opinions differed of course, in so far that one man would have liked more time devoted to animal husbandry subjects, another would have liked more about crop growing, but this is only natural. We also interviewed some of the men who took active part in this year's short courses, and their opinions might be briefly summed up in this way:—"It was hard work at times, especially travelling by early and late trains to make connections for the different meetings, but it was all well worth while in order to meet the many interested and appreciative farmers of the province.

P. B.

FARM WEEDS

Article IV

The Eradication of Special Weeds

PREVIOUS articles have dealt with the "Causes of the Prevalence of Weeds", The "Kinds of Weeds", and the "General Control of Weeds." It is the purpose of this and the remaining articles of the series to discuss the "Eradication of Special Weeds" that have got beyond control either by the ordinary system of farm management or, which is most frequently the case, through the lack of a proper system of rotation of crops and good cultivation. In this Province several weeds have become pests, mainly, as we have said, on account of the employment of poor farming methods. So long as these methods are followed, so long will Couch Grass, Ox-eye daisy, Canada thistle, Perennial Sow Thistle, Devil's Paint Brush, and other weeds be serious pests.

(a) COUCH OR QUACK GRASS

Couch Grass is probably the worst weed pest in this Province, and is to a great extent the product of the prevailing type of farming where meadows are maintained for many years without change. It has the advantage over most other weeds in the fact that it makes hay and pasture which is relished by stock. But its vigorous underground rootstocks or stems are very tenacious of life, so that land once infested is not easily cleaned. The rootstocks have buds at the joints, and from these buds arise new plants. In a short time the Couch takes complete possession of the soil and other and more valuable plants are crowded out or starved. In cultivated soil the rootstocks usually go much deeper than they do in pastures and meadows. Methods of control of Couch Grass are all based on the principle of *starvation*, by such cultivation as will prevent the development of green leaves. In time the supply of food stored in the rootstocks in the absence of green leaves is used up, and the plant dies. Simple continuous cultivation would accomplish this object, but quicker results are secured if the cultivation also brings the rootstocks to the surface, where they can be raked together, removed and destroyed.

Couch grass, one of our worst creeping perennial weeds.

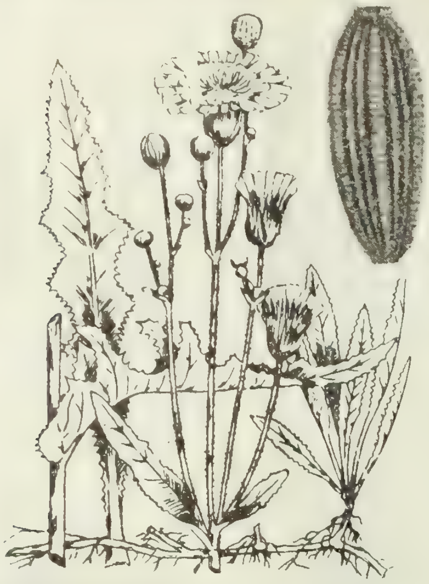
In the case of sod land, it should be plowed six inches deep immediately after the removal of the hay or earlier if possible. Then the plow should be followed at short intervals by the spring-tooth cultivator, striking deeper with each cultivation. This repeated process will gradually shake the roots free from the soil, so that it is possible to gather them with a horse-rake, and to remove them. In late fall the land should be ribbed up, and in the spring it should be cultivated again and planted to a hoed crop such as corn, potatoes, or roots.

It has been shown also that if infested land is plowed and cultivated early and sown thickly to buckwheat or rape the Couch Grass is thoroughly choked out.

Some authorities advocate *deep plowing* of infested sod land, turning a very flat furrow so that the layer of sod is inverted. Then the new surface is rolled, harrowed and carefully cultivated to keep down all new growths.

In dry seasons Couch Grass is more readily killed than in moist seasons. Besides, it is more persistent in clay soils than in sandy soils. When Couch Grass is fairly under control a four-year rotation, such as roots, grain, clover, hay, will prevent further development and if careful cultivation is given it should be practically eradicated.

Ox—eye Daisy and its seed—one of the most common perennial weeds in meadows in Quebec.



Perennial Sow-thistle, a bad creeping perennial, with its seed.

(b) OX-EYE DAISY.

There are few old meadows in this province free from Ox-eye Daisy or White Daisy. Many farmers are under the false impression that a little daisy in the hay improves its quality, but they forget that the few daisies in a field soon become a-multitude. Daisy seeds often escape death in the process of digestion while passing through the animal, and when the manure is spread on the land new daisy plants spring up. When however, such manure is applied to root land there is little chance for the seedling daisies to grow to maturity.

The roots of Ox-eye Daisy do not penetrate deeply and are readily upturned in plowing. The seeds are said to ripen sufficiently to germinate in ten days after the opening of the flowers.

When a field becomes badly infested with Ox-eye Daisy it is advisable to adopt a special three-year rotation, viz., 1. Hoed Crop, 2. Grain Crop, and 3. Clover. The Clover should be cut early to prevent the Daisies from seeding, and the sod plowed and cultivated for a hoed crop the following year.

The cultivation on breaking up the sod should consist of a shallow plowing, followed by the harrow. In a fortnight the spring tooth cultivator is used, and later cross-cultivation is given, but a little deeper. If possible a third or even a fourth cultivation should be given, going a little deeper each time, then the land should be ribbed up finally just before winter sets in with a double mould-board plow.

In pasture lands the daisies should be cut before they can seed, if sheep cannot be utilized for close-grazing the weeds.

The seeds of Ox-eye Daisy are frequently found in the poorer grades of timothy seed and other grass seeds, consequently farmers should buy none but the best grades of these seeds.

(c) PERENNIAL SOW-THISTLE

This weed was observed abundantly during the past season in both grain fields and pastures. It is spreading rapidly, and is likely to become one of the most difficult of weeds to control and eradicate, especially on the clay loams of the low undrained level lands of the St. John's and St. Hyacinthe districts. It propagates itself by means of plumed seeds and underground milky rootstocks. It can be readily told from the two species of annual sow-thistles by its larger flower-heads, the scales of which, as well as the stems, are covered with glandular hairs.

Any successful treatment of the Perennial Sow-thistle must follow along the line of short rotations and surface cultivation during the summer, with smothering crops, such as buckwheat, rape, turnips or corn.

One method is to cultivate until about the 15th of June, then sow to rape in drills wide enough apart to allow of a one-horse cultivator. Cultivation should be given every week, as long as it is possible, between the rows. After the rape is cut or pastured the land should be ridged up for the winter, and next spring given the necessary cultivation for a hoed crop.

Another common method, one which is also applicable to many other noxious creeping perennials, is to gang-plow shallow after harvest, then to cultivate immediately with the broad-shared cultivator; then plow a little deeper, followed by the cultivator every ten days as long as the season lasts, then rib up for the winter; in the spring to cultivate frequently until 15th June, and sow rape.

A third method is the adoption of a short rotation of clover and cereals. The clover is cut in June and the land plowed four inches deep. Frequent and thorough cultivation is given during the remainder of the summer.—W.L.

TREATMENT AGAINST SMUT

Losses from Oat Smut

IN 1913 the area devoted to oats in the Province of Quebec was 1,303,000 acres, which yielded 39,000,000 bushels, valued at $18,732,000. The average percentage of Smut in oats given by Mr. H.T. Güssow, Dominion Botanist, Ottawa, is over 7 per cent. Taking this loss (7%) as a basis for Quebec, the total money loss due to Smut in Oats in 1913 was $1,311,240. It is very probable that the loss in 1914 was even more severe than that of the year before.

A loss of one million three hundred and eleven thousand dollars is a heavy penalty the farmers of Quebec are paying every year for neglect of treating their seed oats with formalin solution. The treatment is so simple and cheap that there is no good reason why every farmer should not practice it.

What is smut ?

Smut is a fungous plant which causes a characteristic disease of oats, wheat, barley, and other grains, affecting the grain in the head and sometimes the chaff as well. The Smut of oats does not injure wheat or barley; similarly the Smut of wheat does not injure oats or barley, and the Smut of barley does not injure wheat or oats.

About harvest time Smut disease is observed in infested grain crops. At that time the diseased heads become sooty coloured on account of the production of thousands of minute bodies called *spores*. In the field these spores are carried away by the wind to uninfested heads, and at thrashing time they are so thoroughly scattered that it is impossible to find a grain which does not have several spores attached to it, although invisible to the naked eye.

When this grain is planted the adherent spores sprout at the same time as the grains themselves; the sprout tubes of the smut enter the tender seedlings of the grain, grow up within their lengthening shoots and enter the forming grain, soon destroying it.

How to Prevent Smut

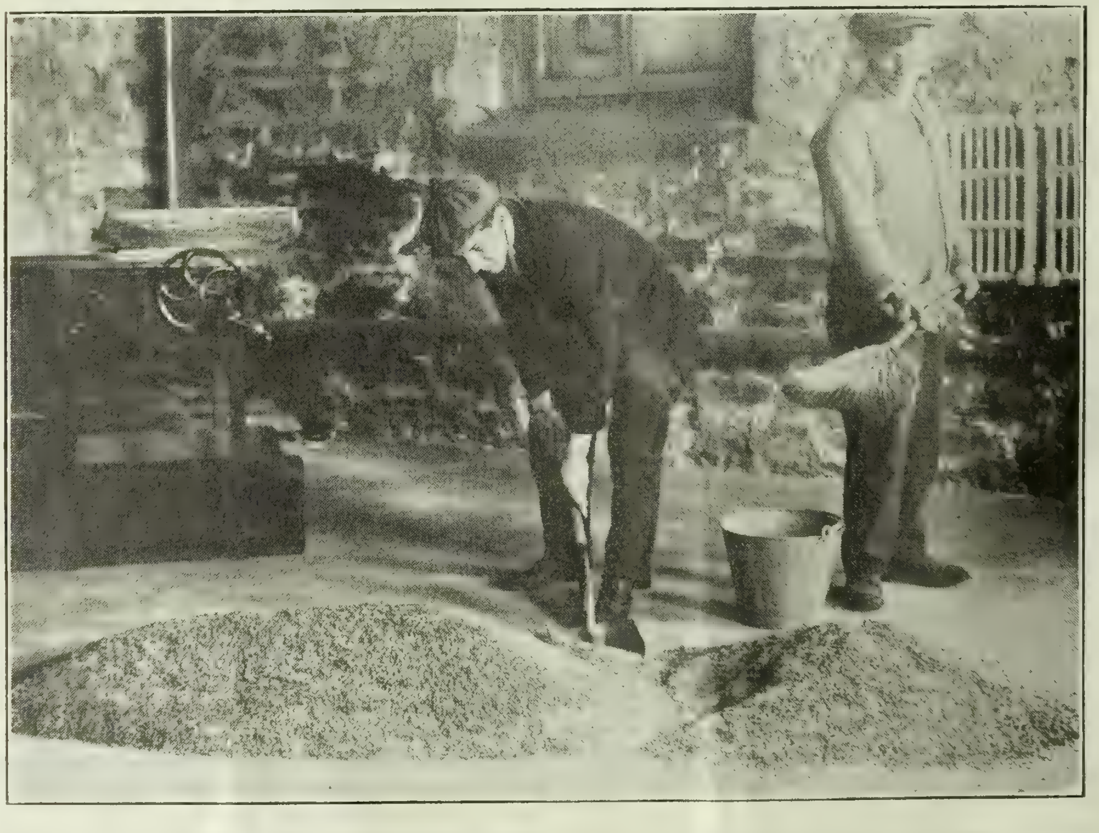
Smut may be prevented by sprinkling seed oats and wheat with a solution of formalin (formaldehyde) a few days before sowing time. Care should be taken that the best grade of formalin, the forty per cent formaldehyde, is used, for very low grades are on the market. It is a liquid and comes in pound bottles. One bottle when diluted with 40 gallons of water is sufficient to treat from 36 to 40 bushels of grain, thus making the cost of treatment about 1 cent per bushel.

The Formalin Treatment

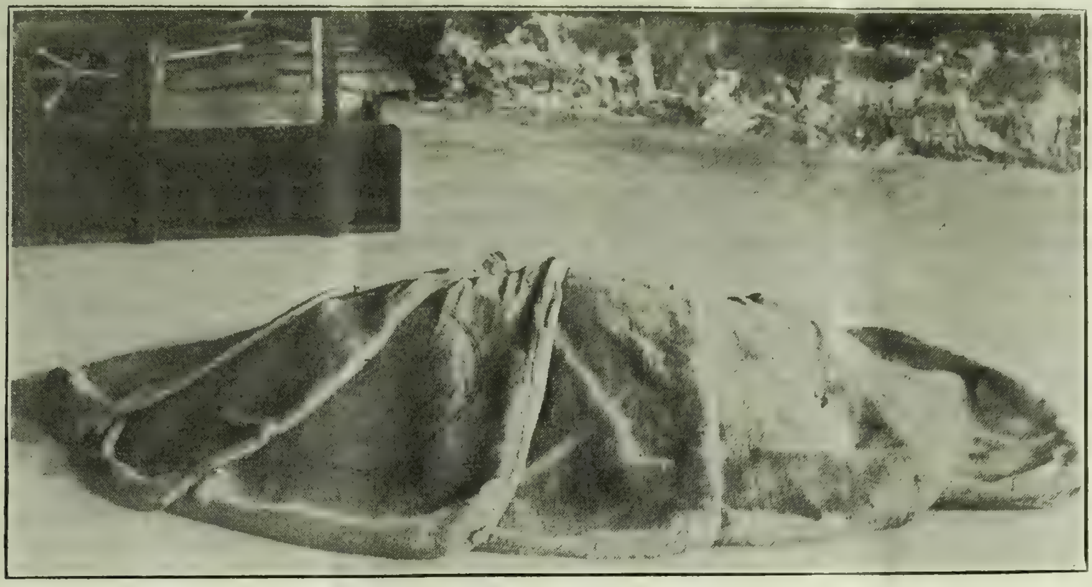
A day or two before the oats are required for seeding they should be piled in a heap on a clean barn floor, and the pound of formalin poured into a barrel containing 40 gallons of water. With a broom or sprinkling can the solution should be sprinkled on the grain, at the same time the grain is shovelled over and over until every grain is wet. The pile of wet grain should be left for two or three hours, then covered with clean sacks for five or six hours or over night. After this the grain should be spread out to dry. In order to avoid recontamination of the treated seed before sowing, it is advisable to dip the bags or sacks in the barrel of formalin solution while the grain is being treated, and allowed to dry. Grain thus treated but not required for seed is perfectly safe to use for feed.

Special Precautions

1. Buy the supply of formalin early so as to have it on hand at seeding time. Two pound-bottles will treat 75 bushels of oats.



Seed Oats are sprinkled with the formalin solutio roughly so that every grain becomes wet.
at the same time are shovelled over tho n by means of a broom or a sprinkling can, and



After the oats are sprinkled with the formalin Solution and showelled over thoroughly, they are left for two or three hours. Then they are covered over with sacks for from 3 or 6 hours or even over-night.

2. Be sure and buy the best grade of formalin (40 per cent formaldehyde); *accept no substitute.*
3. As treated grain swells slightly the seed drill gauges should be so adjusted as to allow for an additional ¼ or 1-3rd bushel per acre.
4. The bags which are to hold the treated grain should be treated by being dipped in the formalin solution and spread out to dry.
5. All the seed oats should be treated whether they appear smutty or not.

W. L.

GREATER AND BETTER CROPS IN 1915

(From Agricultural War-book)

J. H. GRISDALE, Director, Experimental Farms

THE usual measures of crop production in normal years are the industry and ambition of the farmer and the prospective profitable market for the products of his labour.

The Canadian farmer of to-day is not lacking in industry, the markets both immediate and prospective for all the products of his energy have never been better, and to these may be added the call from the motherland for help such as can be given by our farmers and by none better, if they will, in the way of plentiful supplies of foodstuffs of all kinds for man and beast. Given the effective combination of ability to produce and profitable demand for the product, with the further inspiration of patriotic necessity, surely such a year of farming activity may be anticipated for 1915 in Canada as has never before been seen and as will long live in our annals as the banner year in Canadian Agriculture.

Canadian wheat, coarse grains, meats, dairy products and hay are certain to be greatly in demand by Great Britain and her allies during the period of this war and for many months thereafter. These products of our farms are such that, for the most part, but little time is needed to permit of a material increase in the output. True, only a slightly larger acreage can be devoted to each or any one of these crops than was contemplated or planned for in the fall of 1914. Fortunately, however, or possibly we should say unfortunately, the return per acre and therefore the total return of cereals and hoed crops in the country, very largely depends upon cultural methods practised by the individual farmer, as well as upon the area sown thereto. Hence, with every farmer doing his grain seeding better than ever before, handling his hoed crop as it always should be, but seldom or never is, in the way of maintaining a mulch and keeping free from weeds, such an increased return per acre may be anticipated in this country as would astonish the farmer himself and go far toward enabling this country to meet the extraordinary demands the motherland is sure to make upon us.

In crop production, thorough work practically always pays and pays well. A close observance of the following points in connection with cereal and hoed crop production in 1915 would work wonders. Let us all try them.

(1) Make every preparation possible for seeding long before seeding time comes around. (a) Clean, test and bag your seed. (b) Get your horses, harness and implements into good shape. (c) Anything else that can be done before seed time, to facilitate or expedite seeding should be most carefully performed.

2) Lose not a minute when seed time arrives. Get on to the land at the very first opportunity. Earlier seeding usually means bigger crops.

(3) Perform every operation thoroughly:—Do the ploughing well. Disc and harrow the land until a perfect seed bed is prepared. Sow the seed carefully, with no misses from bad driving, no blanks from plugged drills, seed sown not too deep but deep enough, according to character and condition of soil. After seeding, roll if the soil is not too damp, then lightly harrow.

(4) See that water furrows are run where needed.

(5) Keep weeds in check.

(6) In the case of hoed crops, even more thorough work, extending until August, will ensure success.

(7) Do not economize in labour at seed time. A last stroke of the harrow after the seed bed seems perfect usually means extra bushels.

To Summarize:—

Get ready for seeding now.
Prepare land thoroughly for seed.
Use good seed.
Sow seed early.
Sow seed well.

The result:—Much larger crops of a better product.

Meadows cannot now be increased in area nor can much be done to increase the quantity of hay in 1915. Not a few old meadows in the eastern provinces, however, might be broken up and sown to oats and peas after thorough working. The returns would surely be much better than if left in hay. This is true whether the crop be harvested green as hay or allowed to ripen for grain. In Ontario and Quebec, these old meadows sown to corn for forage would give the best returns of all. A little extra work before seeding is worth a light dressing of manure if such is not available. Hay is likely to be dear; grow other forage crops and be in a position to sell a few tons. Selling hay is bad farm practice but war knows no law.

Forage crops and coarse feed in abundance mean cheap production of flesh and milk. Beef can thus be readily produced, mutton and pork made abundantly available and milk be put on the market at a reasonable price with a fair profit to the producer.

By each and every one of us doing the best that is in him and making the very wisest use of every acre that is under his control, we, as Canadian farmers, may do much to help our country, our empire and the great cause of freedom.

RESOLUTIONS OF MAPLE SYRUP PRODUCERS

AT a meeting of the shareholders of The Pure Maple Sugar and Syrup Agricultural Cooperative Association held at Beauceville the 12th January 1915, the following resolutions were adopted:

RESOLVED: That whereas extracts of oils, bearing the name of "Mapleine" and other names suggestive of the maple products are sold to hotel and restaurant keepers throughout Canada for the purpose of mixing corn syrups to give them a maple flavour and to falsely induce their customers to believe that they are eating pure maple products;

And whereas the sale of such is detrimental to the interests of the producers of the maple goods in Canada;

Therefore we do hereby request the Federal authorities to provide a redress to this wrong.

RESOLVED: That whereas at the last session of the Canadian Parliament a law was enacted prohibiting the use of the word "Maple" or of any word a derivative of the same, on labels of any package containing food which was not the product of the maple trees, which came into force the first of January instant (1915):

That whereas, notwithstanding the said law, on the 10th January instant, ten different packages containing adulterated syrups were sold in Montreal, most of them bearing labels containing the words "Pure Maple Flavoured Syrup, Maple Compound, Standard Maple Syrup mixture", and are still constantly sold and offered for sale;

Therefore in order to put a stop to such public contempt of the law we hereby call upon the proper Federal authorities to appoint inspectors to put an end to such outlaws' nefarious work and punish them as provided by the above mentioned law.

RESOLVED: That the Secretary do send copies of the above two resolutions to the Ministers of Justice, Agriculture, Commerce and Inland Revenue.

MAPLE SUGAR SAND

THERE will be a certain demand for maple sugar sand this year and no doubt also in subsequent years. The preparation of this material for the market is easy and inexpensive and its sale will add a little to the annual income from the sugar bush.

Care must be taken to avoid scorching the sand in the evaporator. Those who make good light-coloured maple syrup will get maple sugar sand of good quality. The sand from the evaporator, that collected in the strainer and the sediment of the settling cans, should all be placed in a felt or flannel strainer and washed with hot water or hot sap, stirring thoroughly. Time will be saved by allowing each portion of wash water to drain off before adding more. The washing should be repeated five or six times or at least until the sugar sand no longer tastes sweet. The washings, especially the earlier ones, will contain sugar and may be converted into syrup in the evaporator.

The washed sugar sand should be spread on paper or cotton and allowed to dry. Sugar sand left in a moist or sticky condition is pretty sure to spoil, while clean dry sand will keep indefinitely. The dried sand should be powdery or gritty.

The Chemistry Department of Macdonald College would be glad to receive any practical suggestions for the improvement of the above directions for the treatment of maple sugar sand.

J. F. SNELL.

VERMONT SUGAR MAKERS' MEETING

Better Marketing Emphasized. Publicity Campaign Undertaken. Exhibits attract much interest

A representative of the Journal had the privilege of being present at the annual convention of the Vermont Sugar Makers' Association, held in Montpelier, January 19th-20th. The meeting included an exhibition and a programme of speaking, both of which were decidedly successful. All the leading manufacturers of sugaring apparatus in the States had samples of their wares on exhibit, including seven styles of evaporators. Fifty samples of syrup, thirty of tub sugar and fifteen of cake sugar were in competition for a purse which was divided according to score among all competitors scoring over ninety points—an eminently satisfactory arrangement for the judging of a product of which so many samples are of practically equal merit. There were also two competitions upon collections, one open only to producers, the other open to all, the first prize in each being $25.00. Four collections were entered in the former class and five in the latter. The taste and ingenuity displayed in the arrangement of these collections rendered the exhibition very attractive to spectators. Considering that Montpelier has a population of only eight thousand, the constant stream of visitors through the exhibition hall was truly astonishing, and there can be little doubt that these artistic collections were the chief attraction. Another attractive decorative feature was a model of the State House, built of bricks of maple sugar and lighted by electricity. This model was the work of the President of the Association, Mr. A. A. Carleton, of West Newbury.

In the addresses, marketing questions were featured. It was acknowledged that even in Vermont there is still much room for improvement in production, but it was held that the field for instruction in methods of making syrup and sugar lies chiefly outside the membership of the association. Most of the farmers who take sufficient interest in sugar making to become active members of the association have, by virtue of that very interest, acquired exceptional skill in the manufacturing processes.

A remark by one of the Agricultural Experiment Station workers to the effect that the Station authorities had not yet evolved a policy for extension work in sugar making, elicited a suggestion on the part of a veteran in the industry, Mr. V. I. Spear, Manager of the Vermont Sugar Exchange, that experts should be sent about in the sugaring season to give instruction to farmers while at work. This is a suggestion which may be worthy of consideration here in Quebec as well as in Vermont.

Mr. Spear offered a number of valuable suggestions regarding the preparation of syrup for the market. The practice of canning directly from the evaporator did not meet with his commendation. The slight deepening of colour resulting from reheating in a finishing pan did not, in his opinion, offset the advantages of this practice. He recommended reheating to the boiling point and testing with a hydrometer. He would begin canning at 160° and have the cans closed before they have cooled to 100°.

The use of small cans was strongly recommended. The demand for syrup in packages of less than one gallon was now five times as great as that for gallons, and this preference of the consumer for small packages was no mere passing fad. Small packages were used up before they had time to deteriorate. Cans should be stored in a dry place, not in a damp cellar. Honest dealing with the consumer was the best policy. The grade—fancy or medium—should be marked on the label and medium grade goods should not be substituted for fancy goods without the consumer's consent. Farmers marketing syrup in bulk—and probably two thirds to three fourths of Vermont syrup is so marketed—were advised to keep poor or medium-grade syrup separate from that of high quality, to make every batch as uniform as possible, and to be careful not to finish the syrup thin. "The farmer pays the dealer high for finishing his work", said Mr. Spear.

The Vermont Sugar Makers' Association guarantees not only the purity but also the quality of the produce of its members. A handsome guarantee label is supplied to members and a standard sample is distributed amongst them, so that each member may know what quality of syrup the Association is prepared to stand behind. Some of the speakers at the convention were disposed to recommend further advance in the direction of cooperative or governmental grading of maple products. More than one of them drew a contrast between the backward state of the maple industry in respect to this and other features of marketing and that of the fruit industry in Florida and the Pacific States. These thoroughly organized producers of fruit assess themselves for a sum sufficient to enable them to employ a first class manager and to carry on an aggressive campaign of advertising. The Florida Citrus Growers' Association spends $50,000 a year in this manner with the result that their products now appear in practically every market in the United States and Canada and sell at such prices as to amply justify the expenditure upon the sales department.

Of late Vermont has been devoting some attention to advertising its resources. The State maintains a department of publicity and, at the instance of the Greater Vermont Association, a part of the appropriation assigned to this department was devoted last year to the advertising of maple products. Several thousand copies of a bulletin on maple products were distributed throughout the United States and from the resulting enquiries a list of over 5000 substantial prospective consumers was furnished to the members of the Sugar Makers' Association. The expense of this advertising was small in comparison with the outlay of the fruit growers' association for similar purposes. It has resulted in increased sales at higher prices and it is not improbable that a still more extensive campaign would be equally profitable.

The advantages of attractive containers for maple goods were referred to by several of the speakers. "Maple syrup is a luxury," said one, "and luxuries should be put in luxurious cases." One of the speakers illustrated this point by exhibiting two cans of peaches side by side, one unlabelled the other labelled with an attractively coloured picture of the fruit, and asking which of the two would be more likely to appeal to the consumer. That this point has been grasped by some of the Vermont sugar makers was evident from the very considerable number of exhibits of syrup put up in enamelled gallon cans, which contrasted favourably with the plain tin cans used by the majority of the exhibitors.

Interesting scientific information relating to the maple industry was presented by Prof. C.H. Jones, Chemist of the Vermont Agricultural Experiment Station, Mr. Harold. L. Bailey, Assistant to the Commissioner of Agriculture, and Mr. F. S. Sherwood, of the Bureau of Chemistry of the U.S. Department of Agriculture. Prof. Jones stated that one half the 10,000,000 maples of the State of Vermont are tapped annually and that the average yield is slightly over two pounds per tree. The average annual production of the State is, accordingly, ten million pounds of sugar with a value of one million dollars. The chief factor governing the crop is the weather conditions in the sugaring season. The amount of sugar stored in the tree depends on the weather of the preceding summer, but as probably only about 3 or 4 per cent of the stored sugar is drawn, the summer weather is a minor factor in determining the crop. Mr. Bailey described the insects injurious to the sugar maple and recommended protection of birds as the most effective practical remedy. Although the forest tent caterpillar is the greatest and most spectacular enemy of the sugar maple, its ravages are only periodical. A more constant enemy is the sugar maple borer, whose best natural controller is the downy woodpecker. The gypsy moth and the brown tail moth are not partial to the maple, the former preferring to feed upon the oak, the latter upon the apple and wild cherry. The leopard moth, the imported moth which is most to be feared, has not yet made its appearance in Vermont. Mr. Sherwood reported investigations upon the metals used in the making of buckets and evaporators. He recommended that sap soured in the buckets should not be made into syrup.

Vermont is to be congratulated upon its enterprising association of sugar makers. We in Quebec with our still larger interest in the industry should emulate them. A friendly rivalry will stimulate progress in both communities.

J. F. S.

QUESTIONS ABOUT CEMENT

Editor, Journal of Agriculture,

Q. How is the wire fastened to cement posts?
H. A. C., Magog, P.Q.

Ans. It depends on the style of wire fence that you are going to rig, also on the shape of posts you are going to use as to the best method of attaching these. If it be strand wire, as barbed wire fence, it is possible to leave embedded in the posts, while in the process of making, strands of wire the ends of which project beyond the surface of the post, so that afterwards they may be twisted around the wire. In some cases holes have been left in the post so that wires may be put through these holes and then looped around the fence. You will remember that concrete posts should be well reinforced and should not be used until they have had an opportunity of curing for at least two months. G. E. E.

Q. Is it better to plank over the cement in stable for cattle rather than let them stand on cement? H. A. C., Magog, P.Q.

Ans. If your stable is warm and you have plenty of litter it is not necessary to put plank over the cement. If on the other hand your stable is cold, the drainage from the gutters poor, and litter scarce it would be advisable to cover concrete with plank. In some of the expensively equipped stables cork brick, which is impervious to moisture and which is a good non-conductor of heat, has been placed over the cement, but the expense makes this prohibitive to the ordinary farmer.

G. E. E.

WATER SUPPLY FROM CREEK

Editor, Journal of Agriculture,

AT thel rear of my cottage is a tiny creek for the water supply. Our problem is how to get water up to the cottage. The hill is steep, and the water must be about 50 feet below, a ram could hardly be run, a windmill seems too expensive. I suppose an ordinary force pump in the house would not lift and throw that height. Is there anything for it but an engine? I did not want to face that expense, yet carrying up water

LIVE STOCK

CO-OPERATIVE MARKETING OF WOOL

As a sheep raising province Quebec stands second in the Dominion, having 637,061 sheep or practically one third of the total number of sheep in Canada. The sheep in the Province are essentially of mutton type yet capable of producing some of the finest market grades of wool. This fact has not been generally recognized, with the result that farmers have been willing to sell their wool at a flat rate rather than subject to grade. The injustice of this method is not far to seek—the farmer who sells wool from a purebred flock usually receives no better price than the man who keeps mongrels.

The recent increase in wool values will allow this practice no longer, and farmers have taken the stand that wool must be sold according to grade rather than at a flat rate. With this object in view they are organizing themselves into Wool Growers' Association. The first association was formed in Pontiac county in 1914 and is known as the Pontiac Wool Growers' Association. In 1914 ninety-four farmers sold their wool through this association according to grade, they were paid from four to six cents in advance of current prices prevailing throughout the Province. Many new members have been added and the association expects to sell several carloads of graded wool from year to year. Farmers in other parts of the Province are organizing similar associations and it is only a matter of time until much of the wool in the Province will be sold in this way.

ESSENTIALS FOR SUCCESSFUL ORGANIZATION

1. *A Sufficient Number of Sheep.—*

Taking the Province of Quebec as a whole there is an average of over ten thousand sheep per county. Some counties have more than double this number while others have considerably less. However it is safe to say there are few counties that have not more than sufficient sheep to warrant the formation of a wool association. To insure a good working basis, an association should have approximately two thousand sheep within the association limits. This number insures about one hundred and twenty-five flocks, and members with an average annual wool output of some twelve thousand pounds. With less than this number freight rates on shipments of wool will be higher and moreover the expense of operation is increased per member, hence the real benefits to the farmers are not so great. However, where a smaller number of sheep raisers are grouped together and have a good market for wool close at hand, a successful association may be organized on a smaller scale.

2. *Good Quality of Wool*

The quality of wool depends largely on the breed or breeds kept. Roughly speaking all breeds of sheep may be divided into three classes, fine wooled, medium wooled and coarse or long wooled breeds. The fine wools include the merinos and their crosses and of these there are practically none in the province, owing to the popularity of

Conditions which tend to the accumulation of dirt and chaff in the fleece.

---

is too hard. Could you favour me with a suggestion. Do you recommend gasoline, or "hot air"?

C. F. W.

Answer:—If you can get a fall of 8 to 10 feet you can use a ram. The minimum supply should be not less than 3 gallons per minute. The ram is best if you can use it. If you must use an engine, use a gasoline engine of 1½ to 2 h.p. Have this drive your force pump by means of belt and pump jack. Place the pump not more than 20 feet vertically above the water surface, in fact it is best to put your engine and pump down near the brook. You might have the brook supply water to a tank, or barrel, at one side and pump out of the tank, or barrel. In this case you could have your pump cylinder under water. This is the best arrangement as the valves are kept moist and in good condition.

You could not place the pump in the house, the suction lift is too great. Use the ram if possible, it is the cheapest and best.

C. J. LYNDE

CO-OPERATIVE AGRICULTURAL SOCIETY OF THE YAMASKA VALLEY

Election of Officers

At the general meeting held on January 21st, Messrs David Brodeur, Napoléon Ouimet, Antoine Monty, Choquette and Adelard Brisson were unanimously elected officers.

At a subsequent meeting of the officers Mr. Antoine Monty was elected president, and Mr. Napoléon Ouimet vice-president of the Society.

Financial Statement of the Co-operative Agricultural Society of the Yamaska Valley to the 31st *December* 1914

ASSETS		
Cash in hand (deposited at Molson's Bank)	$1,119.58	
Bills receivable (bills of clients on hand)	43,842.61	
Property (cost of construction less depreciation)	26,700.00	
Fixtures and implements (Furniture, fixtures, tools, etc., less depreciation)	2,200.00	
Various merchandise (pipes, twine, chemical manure, etc)	782.17	
Accounts receivable (accounts not yet settled)	8,816.59	
Travelling expenses (amount allowed to S. Kornberg and to be paid back by him)	48.65	
Demonstration field (Disbursements made for the cultivation of tobacco for the government, and to be reimbursed	244.60	
Inventory of Tobacco crop:—		
1911 crop	9,122.67	
1912 crop	9,048.82	
1913 crop	49,095.46	
Boxes (Value of cases on hand after 1913 packing)	752.20	
TOTAL ASSETS		$151,773.35
LIABILITIES		
Capital paid	26,400.00	
Bills payable (Molson's Bank)	44,500.00	
Mortgage on Store-house	17,000.00	
Interest on Mortgage	1,278.48	
S. Kornberg, (commission)	967.38	
1914 crop	432.00	
TOTAL LIABILITIES		90,577.86
Balance, showing a surplus of		$61,195.49
made up as follows:—		
Grants received	$16,800.00	
Profits realized on three years' crops	44,395.49	

E. N. NADEAU,
NAP. NADEAU,

Auditors

POTASH AND WOOD ASHES

Some Valuable Products for Land Improvement Available from this Source

With the supply of potash from the German mines shut off by war conditions, Canada should now give attention to the large quantity of this fertilizing agent which is allowed to go to waste through want of care and conservation of the annual production of wood ashes.

Throughout a large part of Canada the chief fuel at all seasons, but more especially in winter, is wood. In the eastern provinces, hardwoods are chiefly used. These woods, especially beech and maple, are rich in potash, varying from 5 to 13 per cent, according to conditions of dryness of the wood and care of the ashes. Other valuable ingredients of wood ashes are a small proportion of phosphoric acid and about fifty per cent of carbonate of lime.

In the clearing of wood lots and in the burning of debris after taking out the fuel supply, large amounts of ashes are produced. These as a rule are left where the burning is done, and are consequently wasted.

Wood ashes should be carefully stored, in fire proof receptacles if possible; in any event away from any danger of fire, and should be kept dry to avoid leaching. In the spring they should be spread upon the land. They are especially valuable as a fertilizer and to encourage the growth of clover and the better grasses.

Wood ashes, by hastening the decay of organic matter in soils, render more readily available the nitrogen contained therein. In sandy soil, wood ashes supply the phosphoric acid and lime in which these soils are deficient, while, on clay lands, the lime content of the ashes tends to render available the potash salts already present in abundance. Potash as supplied to the land through the medium of wood ashes has a distinct advantage over the potash salts as imported from Germany, in that it is in a very soluble form, and hence it at once available for plant food.

The importance of wood ashes, as shown above, as a fertilizer can hardly be over-estimated. It is consequently of first interest to the agriculturists and lumber interests of Canada to conserve the supply wherever and by what process produced.

During the present winter large undertakings in land clearing and right-of-way clearing of railway lines will be in progress from the burning of the debris of which large amounts of ashes will accumulate. Some steps should be taken to provide that these ashes are not wasted, as apart from the difficulty of securing potash supplies, the market value of ashes at present is from $8.00 to $12.00 per ton, depending upon quality.—*Conservation.*

the mutton breeds. Of the middle wooled breeds the Southdown, Shropshire, Oxford, Hampshire, Cheviot, Dorset Horn and Suffolk are all popular, each for its particular purpose. The Southdown produces rather a light fleece of extremely fine white wool which is known as a clothing wool. The Hampshire, Suffolk and Dorset Horn produce wool of the Southdown character, yet a heavier fleece and somewhat coarser of fibre. The Shropshire gives a heavy fleece of good length and possessing a felting quality which characterizes this wool as the best of our combing wools. The Oxford produces a heavier fleece than the Shropshire, with more length and coarseness of fibre. The Cheviot, a breed which has just recently been introduced, produces a fleece that is dense, fine and extremely white in character.

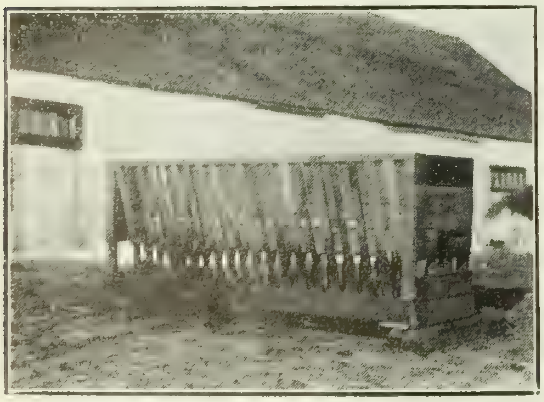
The long wooled breeds all produce a very heavy fleece. In the Province the Leicester has attained much more popularity than either the Lincoln or Cotswold, and the fleece is the finest and most lustrous of the long wooled breeds.

The variation in the topography and climatic conditions as well as market requirements and personal likes and dislikes has necessitated the introduction of a number of breeds into the Province. However, those breeds which were not suitable to conditions were eliminated in the early stages of their introduction, so that at the present time there are comparatively speaking few breeds in the Province. The general class of sheep is of a high order combining good mutton type with the best wool producing qualities, hence so far as breeds are concerned the quality of wool will rank high for Associations in most districts.

3. *Uniformity of Breeding*

While it is true that there is a small number of breeds in the Province yet there are few sections in which less than two breeds are kept. In many sections continuous crossbreeding has been practiced with the result that many flocks so handled are little better than nondescripts, producing poor market lambs and a light fleece of low grade. Crossing with some breeds may be resorted to for the production of better market lambs, but the keeping of several breeds in a district and the crossing of these without system results in less uniformity of both lambs and wool. It is known that the best wooled sheep are those that produce the highest percentage of number one lambs, so that the practice of continuous crossbreeding should be changed to a continuous system of grading up of those breeds which have shown themselves adapted to prevailing conditions.

Uniformity of wool clip is important in its sale. Each grade has a market value, but the larger the quantity of a particular grade and the closer resemblance of each fleece to that of the others in the same lot, the more suitable will that lot of wool be for the manufacturer, and hence will command a higher price. When Associations are once formed, it should be the policy of the members to arrive at a definite conclusion as to the breed most suited to the district and aim to introduce breeding stock largely of this breed. This practice if continued for a few years would insure a very uniform grade of wool as well as lambs. As far as possible all members of the Association should work co-operatively in their breeding operations for the best results in both wool and mutton, since the two go hand in hand.



A rack which insures a clean fleece may be used for inside or outside feeding.

It is also necessary to maintain the individual standard of each flock. Each fleece should be compared with the standard of excellence laid down for superior wool. Any tendency to deterioration should be corrected at once and weak or faulty members disposed of. Each farmer should endeavor to select a ram that is strong in those points where the ewes have a tendency to be weak. Strength and vigour are essential. A weak constitution is usually associated with openers and lightness of fleece.

4. *Good Condition of Wool*

Apart from breeding there are other factors which materially lower wool values, such as improper feeding and housing and the introduction of vegetable matter in the form of chaff, seeds and burs. The strongest and best growth of wool is produced from flocks that are suitably housed and kept in a strong healthy vigorous condition. Anything which lowers the vitality of the sheep, such as lack of proper feed and exercise, exposure to cold, rain and snow, and the prevalence of ticks, has a direct effect on the character of the wool. Our long severe winters compel housing, and winter feeding is responsible for the accumulation of chaff and seeds in the fleece. The secretion of yolk is essential to the health of wool. Where chaff and seeds adhere to the wool fibres they absorb this secretion, leaving the wool dry, harsh and brittle. Seedy or rejection wool depreciates from six to eight cents per pound in value. Where flocks are allowed to run around a straw stack seedy and chaffy wool is inevitable. Sheep should be given a separate yard, and with the use of a proper feeding rack this evil can be largely eliminated.

Burs are becoming more prevalent from year to year. Their increase seems to emanate from unoccupied farm homes and especially around farm buildings. They become attached to the fleece in the open, and if thick the fleece becomes a solid mat. Burry wool requires to be put through a special process known as carbonization which is expensive and at the same time destroys some of the valuable wool properties. Burs are easily eradicated by spudding and cutting and very often a little time and attention would free a farm of this pest.

The condition of the wool rests with the farmer himself and is controlled by proper methods of feeding and management.

(To be continued)

A. A. MacMILLAN,

In charge of Sheep Husbandry,

Macdonald College.

WINTER MANAGEMENT OF BROOD SOWS

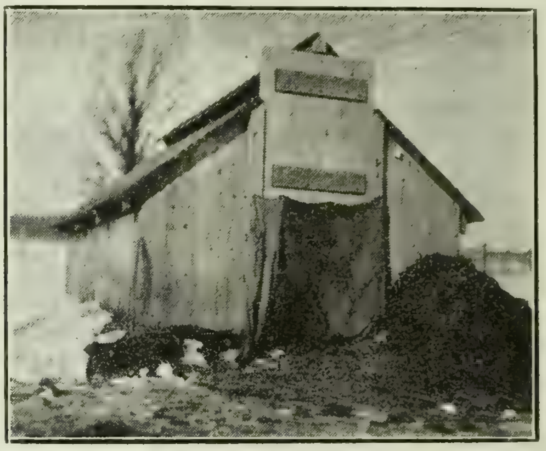
WHAT the sow's litter will be, both in numbers and in vigor, depends to a great extent on the condition of the sow at the time of breeding and during the period of gestation. It is a mistake to have the sow very fat. She should be thrifty and vigorous, in fair flesh, but not so fleshy that she will lose her activity. To produce these conditions exercise, fresh air and dry healthy quarters are factors as necessary as proper feed. It is a hard matter to provide these factors in winter and thus winter management of brood sows presents considerable difficulty.

HOUSING THE SOW

If only a few sows are kept it is advisable, if possible, to give them the run of a barn yard where they will take a great deal of exercise in working over straw and manure. A dry well-bedded pen, free from draughts, and opening to the yard should be provided. Feeding troughs should be at some distance from the pen, thus encouraging the sows to come out and take exercise. These conditions will give as good results as can be obtained.

At Macdonald College the method followed is the use of small portable houses. One of these houses is shown in the accompanying illustration. Each house is 7 x 9 ft. and is 3 ft. from the floor to the eaves. The walls and floor are double boarded. A ventilator is provided at the top of the roof and a small sliding door is placed in one end. The whole is built on skids so that the pen may easily be moved.

Each house is placed in a yard in such a position that the door faces the south. Manure is banked up around the bottom of the pen. Bagging is tacked over the door to prevent draughts. It is not necessary to close the door, even in the coldest weather, unless the sows happen to pull the bagging off during a stormy or cold spell. Two sows are allotted to each pen. Feeding is done in a corner of the yard at some distance from the pen and the sows take their exercise in going for their feed.



Small portable pen used at Macdonald College as winter quarters for brood sows.

Several styles of these portable houses are in use. A great many A shaped houses are used, and shanty roofed buildings are in favor with some. In any case the cost of construction is small and the houses are valuable at all times of the year. Being portable they help to solve the problem of providing fresh runs for hogs in summer.

FEEDING THE SOW

The meal ration should not be of a very fattening nature. Large proportions of such feeds as barley or corn should not be used. Equal parts of ground oats and shorts would probably be an ideal ration, but oats are so high-priced now that it is not advisable to feed them extensively. Equal parts of ground corn, ground oats, and shorts or equal parts of ground barley, ground oats and shorts would form two other very good rations. With oats out of the question a ration consisting of one part of ground barley to two parts of shorts, or one of one part of ground corn to two parts of shorts, might safely be used. Generally it is advisable to feed the meal as a slop rather than dry thus reducing the waste that is occasioned by dry feeding.

In addition to the meal ration the sow requires a bulky feed. Alfalfa answers this purpose very well. When alfalfa is not available clover hay may be used. Roots should also form part of the ration. Fairly large quantities of roots may be used to advantage, but even one turnip or mangel to each sow per day will add bulk to the ration and act as a regulator for the digestive system.

FARROWING TIME

At all times the attendant should seek to gain the confidence of the sow so that she will not become excited or alarmed if any attention is required at farrowing time. Records of date of service should be carefully kept so that farrowing may be correctly anticipated. About a week before farrowing the sow should be moved to a fairly warm, dry, and well-ventilated farrowing pen. No great change in feed should be made. The meal should be slightly reduced, and fed as a thinner slop than usual. The feeding of roots and hay should be continued. It is extremely important that constipation be avoided as the chances are that should it occur the litter will be lost and the life of the sow will be endangered. If constipation is feared a small amount of linseed meal added to the ration will have a beneficial effect.

It is advisable to provide a guard rail in the farrowing pen. This may be made by fastening 8 inch planks, with edges to the partition, a few inches above the bedding. The rail need not be put all around the pen, but only where the sow is most likely to make her bed. It will prevent the sow from crushing the little pigs when she lies down, as they may find protection under the guard rail instead of being squeezed up against the wall of the pen. For a small sow considerable bedding may be used safely. But in the case of a large and clumsy sow it is dangerous to use too much straw.

If the sow is quiet while farrowing, and the pigs are strong, nothing need be done. But if the sow is restless and farrowing is prolonged, or if the little pigs are weak, they should be taken away and kept in a warm box or basket until the sow is quiet again after which they may be safely returned to the sow.

A. E. MACLAURIN,

Macdonald College

ANNUAL MEETING CANADIAN AYRSHIRE BREEDERS ASSOCIATION

THE 44th annual meeting of the Canadian Ayrshire Breeders Association was held in Montreal on February 10th, 1914. There was assembled a larger number of members than at any previous gathering. The meeting was ably presided over by P.D. McArthur, of North Georgetown, Que., who in his report feelingly referred to the painful conditions in Europe caused by the terrible war. He also referred to the noble part taken by Canada in fulfilling her duty to the mother land, by giving of her sons and otherwise assisting in this critical time. He expressed gratification at the progress made by the Association during 1914, under the severest financial stringency experienced for many years. This indicated the stability of the Ayrshire business. He advised breeders to continue to develop their herds, as he was of the opinion that immediately the War was over there would be a great demand for choice Ayrshires for which there was a growing demand as Ayrshires were proving to be great producers and the most economical dairy breed. He called special attention to the growing popularity of the Ayrshire in all the provinces especially in Quebec, where 75 per cent of the requests made to the Department were for Ayrshire bulls.

The Secretary, W. F. Stephen of Huntingdon, Que., in his report also referred to the serious conditions caused by the European War. He reported the Ayrshire business on a good solid basis, and that Ayrshire breeders were doing well, considering the financial stringency. The membership list totalled 1222, an increase of 138 during the year, residing in the various provinces as follows: Quebec 561, Ontario 390, Alberta 64, Nova Scotia 48, New Brunswick 39, Manitoba 35, Saskatchewan 29, Prince Edward Island 24, British Columbia 20, and the United States 12, — an increase in every province. There have been 26 resignations and several deaths.

Registrations numbered 3496, an increase of 238 over 1913, Quebec Province making the greatest gain. Ayrshires had made splendid showings at all the leading exhibitions in Canada, and good records in the Dairy Tests. Applications to the Record of Performance test numbered over 400 during the year and 124 Diplomas were issued for cows and heifers that had given sufficient milk and butter fat to qualify. The following cows and heifers now hold the records in their respective classes,—Mature class — Milkmaid 7th, 28769—with 16696 lbs. milk, 729 lbs. fat, owned by A. McRae & Sons, Charlottetown, P.E.I.; Four-year-old class,—Dairy of Ferndale, 26735—with 15534, lbs. milk, 590 lbs. fat, owned by Wm. C. Tully, Athelstan, Que. (This cow has also a two-year record of 30064 lbs. milk and 1111. lbs. fat.) Three-year-old class—Hazel of Bonnie Brae, 30676—with 13017 lbs. milk and 488 lbs. fat, owned by G.D. Mode, Vankleek Hill, Ont. (This heifer has a two-year record of 22129 lbs. milk and 861 lbs. fat.) Two-year-old class,—Briery of Springbank 2nd, 32137—with 14131 lbs. milk and 520.49 lbs. fat, owned by A. S. Turner & Sons, Ryckman's Corners, Ont. In all TWENTY-SIX bulls, having four or more progeny qualify, have been registered. Scottie, 19718 —bred by W. W. Ballantyne, Stratford, Ont., heads the list with 13 of his progeny registered.

The Secretary urged the breeders to enter their cows in this test as they would find it profitable to do so.

Volume 23 of the Herd Book was issued containing 3554 pedigrees of Ayrshire cows and heifers and 1418 transfers besides other valuable information to Ayrshire breeders.

The Annual contained 188 pages of interesting information and 2000 copies were printed in English and 700 in French. These were sent out to all Ayrshire breeders in Canada and to a number in the United States and other countries and to others on inquiry.

10000 copies of the records of 426 Ayrshire cows and heifers were published and widely circulated. Both the President and Secretary stated that the new United States regulations, which came into effect on July 1st, 1914, had practically stopped our trade in dairy cattle with the United States. This regulation requires that the Department Veterinarian give a certificate with every shipment of dairy cattle going to the United States, that no tuberculosis has existed on the premises from which the cattle are taken, for a period of 60 days previous to shipment.

There are now five Ayrshire Clubs in Canada in Menie, Southern Counties, Brockville, Alberta and one in British Columbia. These Clubs were doing good work for the breed by encouraging community breeding and otherwise fostering the breed in their respective districts.

32 breeders during the year and 154 in all had registered their farm names. This gives them the absolute use of the name in connection with the registered certificates of their stock. The Secretary paid a high tribute to the press for the manner in which the many agricultural papers published the copy sent them from time to time. This refers particularly to the publishing of the records of cows and heifers qualified in the Record of Performance Test.

In closing his address the Secretary referred to the increased work of the Association, which indicated that the demand for Ayrshires was increasing at a considerable rate.

The financial statement showed receipts to be $8,851.02, expenditure $7,792.94, and a balance on hand of $5,712.15.

Resolutions:—

That the rule in regard to Record of Performance Test be left as at present and that we recommend that the time limit previous to the freshening in the four-year old and mature clases he eliminated.

That we believe the time has come when all Ayrshires should have some mark of identification and we believe that the tattoo system is the best for this purpose. We hereby recommend this system to our breeders with a view to making it a permanent rule at some future meeting, that all Ayrshires be thus marked.

That in the publication of the Herd Book in future the record of Performance test be published only once, with English and French headings.

That a committee be appointed to confer with the Executives of other organized Live Stock Associations with the view of organizing an Executive body whose duty will be to assist the Live Stock interests of the country. While this committee might be able to assist in many lines of Live Stock advancement the one of vital importance now before the stockmen is the question of freight rates which have recently been so increased as to prove detrimental to the Live Stock interests. Messrs. Ballantyne, McKee and Turner were then appointed by the meeting as delegates to represent the Association at a meeting of the Dominion Cattle Breeders Association in Toronto the middle of this month.

That in future only the cows and bulls that have qualified during the year be printed in the Herd Book of that year.

That in publishing the Herd Book in future we omit the descriptions of markings, simply putting in the general color and also omit the sire of sire and dam and instead of publishing the pounds of milk and fat give the record number of the cow and the volume in which her test is printed.

That in view of the increased grant to London Exhibition, the management be respectfully asked to make senior and junior sections in both male and female Calf Classes and in place of the class for four calves make a class for Breeders young herd, to be made up of one male and four females, under two years of age, females to be bred and owned by exhibitor.

That should any Canadian Ayrshire Breeders exhibit their herds at the coming Panama Pacific Exposition to be held in San Francisco next October, they be granted from the funds of the Association an amount equal to one half the freight rate to and from San Francisco, going and returning by shortest route.

That in view of the fact that there are many Ayrshire cows that have registered in the Record of Performance test, we recommend to Fair Boards the advisability of introducing in their respective prize lists classes for cows and heifers that have qualified in this test; the awards to be based on points allowed for conformation and an additional one point for every ten points of butter fat over and above the amount required for qualification.

That we hereby recommend to all Fair Boards under whose supervision a Dairy Test is conducted that where there is no rule to that effect a rule be inserted that all cows and heifers entered in the test be required to freshen at least seven full days before the test commences.

That whereas during the past year the Registration Committee have been called upon to pass approval on application forms received at the record offices, because of inaccuracies, omissions and discrepancies in these forms, largely caused through carelessness or lack of thorough knowledge of the owner of the herd, or through lack of information because of the death or removal of the original owner of an animal, therefore we strongly recommend to our breeders the advisability of keeping private herd records and entering the birth date and sale date of animals therein immediately after birth or sale, taking accurate markings on the diagram, and forwarding all applications for registration and transfers to the Record Office promptly. By doing so breeders will save much delay in the issuing of Certificates.

That a silver cup be given each year to the winning 2, 3, 4, year old and mature classes, the cup to be of the value of not more than $15.00.

The scale to be worked out by the Secretary and the Chief Inspector of the Record of Performance test.

Officers for 1915

Honorary President—John Bright, Ottawa, Ont.
President—A. H. Trimble, Red Deer, Alta.
Vice-President—M. St. Marie, Compton, Que.
Secretary-Treasurer—W. F. Stephen, Huntingdon, Que.

Vice-Presidents :

Ontario, J. L. Stansell, Straffordville, Ont.
Quebec, Robert Ness, Howick, Que.
Manitoba, William Braid, Oak River, Man.
Saskatchewan, F. H. O. Harrison, Pense, Sask.
Alberta, Rowland Ness, DeWinton, Alta.
British Columbia, Edwin A. Wells, Sardis, B.C.
Prince Edward Island, Jas. Easton, Charlottetown, P.E.I.
Nova Scotia, F. S. Black, Amherst, N. S.
New Brunswick, G. C. P. McIntyre, St. John, N. B.

Honorary Life Members:—

Hon. Sydney Fisher, Knowlton, Que.
Daniel Drummond, Ottawa, Ont.
David Morton, Hamilton, Ont.
Robert Robertson, Charlottetown, P.E.I.
J. W. Jardine, Hamilton, Ont.
George Hill, Delaware, Ont.
Robert Ness, Howick, Que.
George Muir, Youville, Que.
Dr. J. G. Rutherford, Calgary, Alta.
Victor Begg, Moose Creek, Ont.
Nap. Lachapelle, St. Paul L'Ermite.

Directors:—

Western

A. H. Trimble, Red Deer, Alta.
W. W. Ballantyne, Stratford, Ont.
John McKee, Norwich, Ont.
A. S. Turner, Ryckman's Cor. Ont.
Alex. Hume, Campbellford, Ont.
Wm. Stewart, Jr. Campbellford, Ont.
Frank H. Harris, Mount Elgin, Ont.

Eastern

R. R. Ness, Howick, Que.
Hon. Wm. Owens, Montreal, Que.
Jas. Bryson, Brysonville, Que.
P. D. McArthur, North Georgetown, Que.
Fred McRae, Charlottetown, P.E.I.
M. Ste. Marie, Compton, Que.
L. J. Tarte, Montreal, Que.

AYRSHIRE MEN BANQUET

THE Annual meeting of the Canadian Ayrshire Breeders Association closed with a Banquet at the Queen's Hotel, Montreal on the evening of Feb. 10th, About 75 of the members and their guests sat at the tables. A number of speeches of interest were given by Dr. F. C. Harrison, Principal of Macdonald College, Prof. J. A. Ruddick, Dairy Commissioner, Ottawa, Prof. H. Barton, also of Macdonald College, R. M. Ballantyne, Montreal, Dr. J. A. Couture, Secretary, General Live Stock Breeders Association of Quebec, A. L. McRidie, Editor, Canadian Countryman, Toronto, Ont., H. B. Cowan, Editor, Farm, & Dairy, Peterboro, Ont., L. J. Tarte, Editor La Patrie, Montreal, Thomas Swift, staff Editor, Ottawa Valley Journal, and Gilbert McMillan, Trout River, Que. All paid tributes to the Ayrshire cow, especially Mr. Swift.

The secretary read letters of regret from the Hon. M. Burrell, Hon. J. E. Caron, Sir H. Montagu Allan, and a number of others.

Songs, most of them being of a patriotic character, enlivened the processings. The singers were Mr. S. Dunn, bass, Mr. Bisset, Tenor, and Mr. Breese, accompanist and humorist. This was the most enjoyable banquet yet held by the Association.

VISITS TO AYRSHIRE HERDS

ONE of the pleasing features of the annual meeting of the Ayrshire Association when held in Montreal is the visit to Macdonald College at St. Anne de Bellevue to inspect the Ayrshire herd kept on the College farm, as well as to visit other Ayrshire breeders in that vicinity and inspect their herds and steadings.

On Thursday, the day after the annual meeting about 95 of the members and their friends left Bonaventure station at 8 A. M. The first stop was at Beaconsfield, where the party visited on invitation, "Allancroft" and inspected the fine stables and Ayrshire herd of Sir. H. Montagu Allan. The party were accompanied by his Secretary, Mr. E. A. Shanahan, who conducted them to the stables where they were met by the capable manager, Mr. Wm. Greenshields. Here were seen about 50 Ayrshires of splendid type, and choice breeding, headed by the grand bull "Finlayston San Toy". All the cows gave evidence of being big producers and the records proved that to be the case. Special milk is put up here for the use of infants and invalids which sells in the city for about 15 cents per quart. After an hour spent here the party entrained for St. Anne de Bellevue. On arrival there they were met by Prof. H. Barton, and taken to the live stock arena at Macdonald College. When the party were seated in this comfortable arena, the Professor had the attendants bring into the ring a number of Ayrshire cows, for comparison. He stated his aim was to have at the college a herd of Ayrshires that would give an average of 1000. lbs. of milk, and drop a calf each year. He was nearing the goal, for last year the 30 Ayrshire cows and heifers had averaged 9395 lbs. of milk, with an average test of 3.8 per cent butter fat. Their highest record was 13000 lbs. milk. He further stated he believed heifers should not freshen until nearly 3 years old in order to give them size and development. In the heifers seen it was evident the professor's theory was all right as the young stock showed fine development. The one thing which characterizes the Ayrshires herd at the College is its splendid type and great uniformity. It was remarked by many that there was a noted improvement on the herd from two years ago. The herd header "Burnside Lucky Cavalier", has developed into a bull of grand proportions and Ayrshire men will follow with interest the results of his breeding on this noted herd. Prof. Barton also had a number of Holsteins, Shorthorns, and Canadian Cattle brought into the Arena and referred to their merits.

At noon, the party divided, some lunching at the College with Dr. Harrison, the principal, and some mmebers of his staff, the others going on to "Stoneycroft" the farm of Mr. James Morgan, where a splendid luncheon had been prepared by the wife of the manager, Mrs. Wm. McIntyre. After luncheon the party looked over the Ayrshires, Clydesdales and Yorkshires, and in large sleighs were conveyed to the farm of the Late Hon. L. J. Forget, where Mr. Bibeau, the manager, bade them welcome. This herd is made up of over 70 head of choice Ayrshires, and the manager is to be congratulated on their fine appearance. From here the party journeyed to St. Anne, calling at the Angus Farm in passing, where a few high bred Ayrshires are kept to supply milk and cream to their homes in the City.

At St. Anne the party divided, some returning to the City, about 35 or more going on to Valleyfield where an hour was spent in the splendid plant of the Montreal Cotton Co's farm. Here is one of the finest, most convenient and comfortable dairy barns in Canada, wherein is kept fine herds of Ayrshires and Holsteins to supply milk for the employees of the Cotton Company and other townsfolk. Manager A. Alseph escorted the visitors through the barn and all were pleased to see such good business herds in this stable, and note the improvement since two years ago.

The party entrained for Howick, where the hospitality of the Ayrshire breeders was extended, and all were made comfortable for the night. On the 12th besides taking in the sale of P. D. McArthur, the herds of R. R. Ness, Hector Cordon, John D. Duncan, Robert Macfarlane, James Bryson, J. W. Logan, and J. P. Cavers, were visited. Those who remained for the following day went to Huntingdon where the day was put in inspecting the herds of McMillan & Leggat, Trout River, D. A. Macfarlane, Kelso, J. T. Elder, Clenelm, W. C. Tully Athelstan, and Chas. F. Hyde, Huntingdon. This closed a most enjoyable, interesting and profitable week for the Ayrshire Association and its members who were in attendance.

THE McARTHUR SALE OF AYRSHIRES

THE auction sale of P. D. McArthur of North Georgetown, Que. held on Feb. 12th, may be termed a grand success, considering the times and season. 28 Ayrshires ranging in ages from two months up brought $5535. an average of nearly $200. The 21 cows and heifers realized $4510. an average of $220. That a man had the courage to put stock under the hammer at such a time of financial depression indicates that he has considerable confidence in the Ayrshire breed, in his herd and in his fellow breeders to buy. In this Mr. McArthur was not disappointed for his stock realized good prices for war time.

The day was all that could be desired, the cowd large, many having come from the annual meeting of the Association held in Montreal on the 10th, and at times the bidding was brisk and keen. Among those present from a distance were. A. H. Trimble, Red Deer, Alta., President of the Ayrshire Association, W. W. Ballantyne, Stratford, John McKee, Norwich, F. H. Harris, Mt. Elgin, J. M. Campbell, Dalkieth, Wm. Stewart and Alex. Hume, Campbellford, A. S. Turner, Ryckman's Corners, James Benning, Williamstown, Geo. R. Palmer, Summerstown, Alex. Watt, Lancaster, L. J. Tarte, Wm. Wylie and J. D. Duncan of Montreal, W. F. Kay, M. P.. and Dan. McArthur, Manager for Geo. H. Montgomery, Philipsburg, Que. Wm. Greenshields, Beaconsfield, Fred McRae, Charlottetown, besides a number of other Ayrshire breeders of note.

Secretary Stephen opened the sale with a few optimistic and encouraging remarks, and advised breeders to get ready to meet the demand for Ayrshires that was sure to come when the financial depression was over.

Auctioneer Philps conducted the sale in his expeditious manner, and sold the 28 head in a little over an hour. Considerable interest was shown in the bidding for the noted cow, Buttercup-24187-, Mr. L. J. Tarte finally becoming the owner of this grand cow. It might be said here that Mr. Tarte, who is Editor of La Patrie in Montreal, is a new man in the Ayrshire world, having lately placed a herd of superior Ayrshire on his farm at Boucherville, Que. When Craigley Pansy 2nd, (Imp) -33815- (a half sister to Auchenbrain Brown Kate 4th, with a milk record of 23022 lbs. milk and 917 lbs. fat) , came into the ring it was expected there would be some keen bidding. Several breeders were after this fine cow, but when she reached $650. the bidding got into two hands, Mr. Tarte and James Benning of Williamstown. The latter finally became the proud owner at $700.

Mr. McArthur kept his calves and yearlings, from which to build up a new herd, as he has some of the best Ayrshire families. Every animal knocked down was sold, and all but one remains in the province of Quebec.

THE DAIRY

THE ANNUAL CONVENTION OF THE QUEBEC SOCIETY OF DAIRY INDUSTRY

Will be held at St. Gabriel de Brandon, Berthier County, March 3rd and 4th, 1915

WEDNESDAY, March 3rd 1915

1.30 p.m. Opening of the Convention by Mr. GUSTAVE BOYER, M.P., President.
2.00 p.m. Mr. Peter Bouchard, Assistant-Inspector, "Report and Statistics".
Discussion of report.
2.45 p.m. Mr. L. P. Lacoursière, Assistant-Inspector, "Annual Report of Inspection".
Discussion of report.
3.00 p.m. Mr. George Cayer, Assistant-Inspector, "Annual Report of Inspection".
Discussion of report.
3.45 p.m. Mr. Omer Tessier, Assistant-Inspector, "The Farmer and the Dairy Industry".

WEDNESDAY EVENING, March 3rd 1915

8.00 p.m. Address of Welcome.
President's response and address.

Addresses of:—The Hon. Ministers of Agriculture of Ottawa, and Quebec, Mr. J. A. Ruddick, Dairy Commissioner, and other distinguished people.
Mr. G. A. Gigault, Deputy Minister of Agriculture, "Co-operation".
Mr. J. N. Lemieux, Dairy Commission, "Butter, butter and still more butter."

THURSDAY MORNING, March 4th 1915

at 9 o'clock sharp

Election of officers for 1915
10.00 a.m. Mr. J. D. Leclair, Inspector-General, "Annual Report."
10.45 a.m. Mr. E. Bourbeau, Inspector - General, "Annual Report."
11.15 a.m. Mr. Auguste Trudel, Director, "Co-operative Society of Quebec Cheesemakers."
Discussion on reports.

THURSDAY AFTERNOON, March 4th 1915

2.00 p.m. Mr. J. B. Trudel, Inspector in Chief, "Controlling Societies."
2.45 p.m. Mr. A. L. Gareau, of Ottawa, "The Packing of Dairy products."
3.30 p.m. Mr. Louis Bibeau, Experimentalist, "Results of Experiments made in 1914."

THURSDAY EVENING, March 4th 1915

7.30 p.m. Mr. J. C. Chapais, Assistant-Commissioner, "Agriculture in Primary Schools."
8.30 p.m. Mr. A. T. Charron, Laboratory Director, "The Pasteurisation of separated milk and milk for cheese."
8.15 p.m. Mr. O. E. Dalaire, Director of the Dairy School, "New dispositions of the laws on the Dairy Industry."

RAILWAY ARRANGEMENTS

All the Railway Companies will allow a reduced fare, providing that a quarter of an hour before the train leaves, a single first class ticket is taken, and a Standard Certificate received from the agent at the station of each railway over which delegates travel. The Secretary of the Convention will countersign these certificates. Everybody welcome.

O. E. DALAIRE,

Secretary, St. Hyacinthe

RECORD OF PERFORMANCE TEST

Ayrshire cows and heifers that have qualified in this test during November, December and January.

Name of cow	Owner	Lbs. Milk	Lbs. Fat	% Fat	No. Days
MATURE					
Gurta of Bellevue 4th—24945,	A. McRae & Sons, Charlottetown, P.E.I.	13119.	516.	3.92	365
Snowdrop—25103,	A. S. Turner & Son, Ryckman's Cornors, Ont.	11408.	450.	2.94	365
Watt's Favourite—28115,	W. E. Tummon, Crookston, Ont.	9054.	432.	4.77	365
Pearl of Spruce Row—29094,	Easton Bros., Charlottetown, P.E.I.	8586.	394.	4.58	344
FOUR YEAR OLD CLASS					
Gem of Spring Brook Farm—31012,	T. J. Hawkins, Landor, N.S.	8732.	342.	3.90	349
THREE YEAR OLD CLASS					
Emeline—35359,	Gillespie Bros., Ventnor, Ont.	9766.	376.	3.84	299
East Court Miss Buttons—35621,	N. S. Agricultural College, Truro, N. S.	8549.	338.	3.95	340
TWO YEAR OLD CLASS					
Chapmanton Pansy 4th—36734,	R. R. Ness, Howick, Que.	9446.	331.	3.50	364
Pearl of Rosehill—39685,	Wm. H. Grenzbach, Woodstock, Ont.	8921.	368.	4.13	364
Fairview Rosie—34187,	Joseph Thompson, Sardis, B.C.	8722.	352.	4.04	365
Neidpath Rose 20th—32985,	E. A. Turner, Carlingford, Ont.	8627.	343.	3.98	356
Rosebud's Pearl—34188,	Joseph Thompson, Sardis, B.C.	8488.	418.	4.92	365
Whitchill White Rose 3rd—35807,	A. S. Turner & Son, Ryckman's Corners, Ont.	8104.	331.	4.08	309
Springbank Countess—33626,	W. E. Tummon, Crookston, Ont.	7850.	320.	4.00	365
Estelle of Riverside—36500,	Hon. W. Owens, Montebello, Que.	7655.	320.	4.17	347
Ryanogue Miss Courtney—40338,	R. R. Ness, Howick, Que.	7299.	327.	4.46	340
Craigielea Fluffy Ruffles—33569,	H. C. Hamill, Box Grove, Ont.	7137.	280.	3.92	365
Bessie 26th of Neidpath—32984,	E. A. Turner, Carlingford, Ont.	6931.	294.	4.24	345
Carleton Venetia 36730,	R. R. Ness, Howick, Que.	6872.	256.	3.73	309
Prettyview Queen—38031,	Wm. J. Connolly, Thedford, Ont.	6730.	311.	4.62	335
Knockinlaw Primrose 4th—49393,	R. R. Ness, Howick, Que.	6720.	273.	4.05	288
Canty of Menie—33603,	Alex. Hume & Co., Menie, Ont.	6522.	285.	4.36	337
Hillhouse Queen Mary—35792,	R. R. Ness, Howick, Que.	6498.	277.	4.11	350

W. F. STEPHEN,

Secretary-Treasurer,

Canadian Ayrshire Breeders' Association
Huntingdon, Que., January 27th, 1915.

CLEANSING MILK CANS AND BOTTLES

Prevailing Practices in Montreal Milk Trade Condemned. — What is efficient cleansing?

By F. C. Harrison, A. Savage and W. Sadler, Macdonald College

(From "The Milk Supply of Montreal")

IN the production of an hygienic milk supply, the treatment of all receptacles destined for the storage, transportation and distribution of the milk is of such vital importance that it is necessary to draw special attention to this phase.

Milk utensils, unless treated in a proper manner, are a constant source of infection and re-infection; many investigators have shown that in the spread of undesirable bacteria no agency is more responsible than unclean, carelessly-washed utensils.

The farmer, the wholesale dealer, and the retailer are each and all at fault as regards the ineffectiveness of the treatment of the utensils used by them.

But factories, creameries and depots are the worst offenders. It seemed to us that throughout the main drawback was the failure on the part of those engaged in the production and sale of milk to appreciate: firstly, that all milk or cream allowed to remain in cans and vessels is specific food for bacteria; secondly, that live steam or boiling water is essential in the final cleansing operations.

TREATMENT UNDER FARM CONDITIONS

On the farms we found few instances where a supply of live steam was available for cleansing purposes. This was not unexpected, for unless steam power be used for other farm operations, the question of the expense involved in providing steam for the dairy alone is an item which has to be considered.

Boiling water, however, can always be provided, and if such is not available, a farmer has failed to secure the first essential for cleaning operations; further, he should under these circumstances be prohibited from selling milk.

After the vessels and can had been washed we frequently saw them inverted in a yard or open space to which dust from barnyards and poultry runs had easy access. This cannot be too strongly deprecated, for the highly undesirable organisms present in such dust may be carried by wind and thus infect the cans before they receive the milk.

In some cases cans, etc., would be left for some considerable time after having contained milk before they were washed; this is a bad practice, because the remains of the milk adhere to the surface of the metal, and unless special precautions are taken subsequent cleaning is much more difficult and less effective.

The grayish material, often seen by us, lining the inside of the utensils, bore out this fact, and, moreover, showed that in such cases milk had been "cooked on" by hot water before it had been thoroughly washed out by means of cold or tepid water.

We would briefly point out that on the farm all utensils, milking pails, strainers, cooling apparatus and cans should, as early as possible, be washed out thoroughly with tepid water to which may be added a little washing soda. Cloths should on no consideration whatever be used, stiff bristled brushes supplying all that is necessary.

Extreme care must be taken to insure all crevices being well cleaned, as these are lodging places for bacteria. It is to be hoped that seamless cans will be more generally adopted, as cleaning operations are thereby much facilitated. We were glad to find that, on the advice of the Montreal milk inspectors, a number of farmers had already provided themselves with utensils of this nature.

The utensils, having been thoroughly washed as above, should be well rinsed with pure water, in order to clear away all milkiness and any remains of the washing soda — the presence of the latter favouring the growth of organisms responsible for "ropy milk."

The final treatment is thorough steaming with live steam or scalding with boiling water for several minutes. The utensils should not be dried with cloths, but should then be inverted in an airy clean place free from dust.

CARELESSNESS IN COLLECTING CENTRES

Depots, factories or creameries which serve as collecting centres for milk, prior to its shipment to the city, follow in almost all cases a practice calculated to nullify the greatest care on the part of the farmer.

After accepting the milk, those depots where separating is carried on return a quantity of the separated milk to the farmers; this is taken away in the same cans in which the whole milk is conveyed.

Almost invariably the separated milk is pumped

POULTRY

HATCHING CHICKS IN INCUBATORS

Operation of the Incubator

THE degree of success in incubation depends upon the method of operation, particularly during the first week. It is well, for amateurs especially, to follow the directions of the manufactures fairly closely. When experience is gained the directions may be varied to suit local conditions. The incubator should be started a few days before the eggs are to be placed in it, in order that an even temperature may be maintained.

TEMPERATURE—A temperature of approximately 103° Fahrenheit should be maintained throughout the hatch. The temperature which the thermometer should register, however, depends upon its position in the incubator chamber. A temperature of 103° should be the registered temperature on a level with the tops of the eggs as they lay upon the trays.

The heat regulator should be adjusted properly to make accurate records of any variations in temperature.

All thermometers should be tested before being used.

CARE OF THE LAMP—An important factor which has to do with the maintaining of a uniform temperature is the flame. The lamp requires filling with oil every morning. The wick should be trimmed at the time. It should be trimmed in such a manner as to give a broad, even flame, the corners of which are slightly rounded. When a new wick is to be used the rough edges should be burned off by holding the end of the wick in the flame of a lighted match. The proper method of trimming the wick is to rub off the charred portion with the fingers and then light. If an even flame does not show as the wick is turned up, remedy the defect and be very sure to round off the corners of the wick so that no smoking will result.

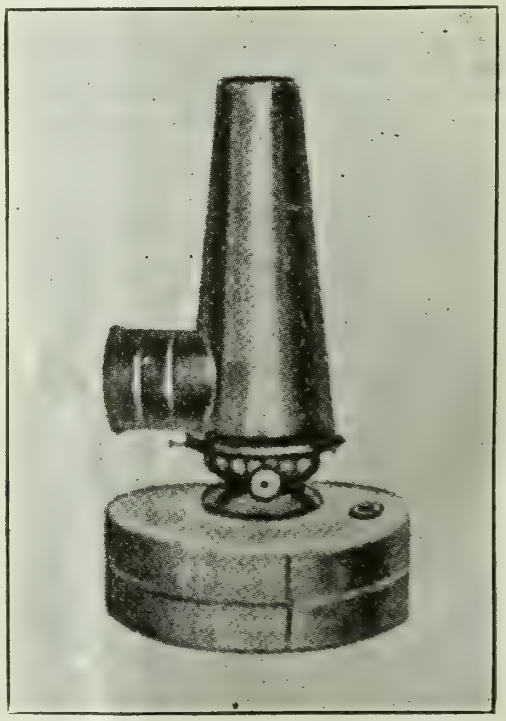
The lamp should be attended to after the eggs are turned and aired in the morning.

Turning the Eggs

During incubation the eggs require to be turned. The turning should not be started before the third day and it should be stopped on about the eighteenth day. The purpose of turning is to prevent the embryo in the egg from becoming stuck to the shell and to give the eggs a uniform temperature. For all practical purposes, turning twice each day is sufficient. The best method is simply to "shuffle" the eggs; that is, remove a few eggs from the front of the tray as it rests on top of the incubator, then roll the balance of the eggs on the tray forward and place those taken off at the back of the tray.

Ventilation

During the development of the embryo, oxygen



Showing an egg tester, used in testing or candling eggs. The egg is held in front of the opening in the short tube to the left which is directly opposite the flame of the lamp. When the light from the flame is concentrated upon the egg its contents can be seen distinctly.

---

from the separator into a tank above, from which it passes through pipes into the cans on the farmer's wagon.

This separated milk is untreated, and as stated elsewhere the tank is usually in a filthy state. Hence, any organisms causing disease—notably tuberculosis—or undesirable flavours or taints in milk are automatically spread by means of the tank and the mixed separated milk through a whole countryside.

The practice thus described entails much extra labour in cleansing operations at the farm, and means that practically any farmer who supplies milk to a depot must of necessity clean and sterilize his cans, on the assumption that they may have become contaminated with disease-producing or other deleterious organisms.

As long as this state of affairs is permitted to exist, the dirty contaminated tank at the depot and a single careless farmer may together subject all the other patrons to the gravest risks.

Investigations into the spread of tuberculosis in the State of Wisconsin, U.S.A., afford ample proof of this statement. These investigations clearly showed that one of the most potent means of transmitting tuberculosis to swine and calves was the unpasteurized by-product—separated milk or whey—returned to farms from the factories.

The proprietors of creameries, factories and depots should be compelled by law to effectively pasteurize all separated milk before it is returned to the farmer; and further, the tanks in which the milk is stored should be maintained in a cleanly and reputable condition.

THE PRACTICE OF WHOLESALE DEALERS

The cleansing of milk cans by some of the wholesale dealers leaves much to be desired. Usually the cans are washed in tanks containing tepid water and washing soda; brushes are used, these being sometimes operated mechanically. After rinsing in clean water the cans are inverted over a steam jet. This is effective if continued for a sufficient length of time, but often the time given is too short. The steaming should be done for at least three minutes.

The cleansing is then assumed to be complete; but in one establishment we found an arrangement for blowing hot air into the inverted cans prior to their removal from the room.

This insures complete drying, thus precluding any residual washings getting back to the farm. As the arrangement is comparatively inexpensive we would recommend its installation in establishments concerned in the distribution of milk.

BOTTLED MILK MAY BE BAD

In Montreal, as in other cities, an increasing demand is being made for milk distributed in bottles. Many people have come to the conclusion that bottled milk is somewhat of the nature of a panacea, and that if milk dealers would adopt this method of distribution the consummation of a satisfactory milk supply is in sight. Theoretically, this would sound feasible, but in actual practice the mere fact that milk is in bottles instead of in cans means nothing. The distribution of milk in bottles is preferable to the more common method of distributing cans only (*a*) when the handling of the milk and its treatment prior to the bottling has been satisfactory; (*b*) when the system of bottling and the cleansing of the bottling apparatus are satisfactory, and (*c*) when the bottles have been properly cleaned and sterilized.

Unless the consumer has reason to feel satisfied as to these main points, the purchasing of milk in bottles is not to be particularly recommended.

We are strongly in favour of the use of bottles or some equally convenient receptacle for milk distribution; and in a well-organized city milk supply such a system must eventually be adopted; but we wish to point out the fallacy of presuming that milk obtainable in bottles is necessarily cleaner and more hygienic than milk purchased from cans.

THE PRACTICE WITH BOTTLES

Where bottling is done to any large extent a bottling machine is used; the mechanism of these machines is such that it is not easy to insure bacteriological cleanliness. We would point out to the users of these machines that the greatest care needs to be taken in cleaning and sterilizing them; otherwise milk which has been well treated is open to contamination again during the bottling process.

In the system of bottle washing as adopted by certain of the leading milk dealers in Montreal, the bottles are inverted in crates and automatically on a continuous chain are carried through the various process incidental to cleasing. Successively they are subjected to jets of water containing soda, to clean rinsing water, to hot water, and steam. Subsequently, any bottles which appear unclean are taken out and cleaned separately.

The details as to procedure vary, of course, in specific establishments, but the general principle is the same.

The system must be considered as moderately satisfactory, but we consider that the length of time in which the bottles are subjected to the steaming part of the process is frequently inadequate. We are fully aware that the time allowed is not seldom looked at from the standpoint of economy of time and business necessity; but having in mind the vital importance which the cleansing processes bear to the bottled milk trade, we consider that all other reasons must be made subservient to the main essential—efficiency of cleansing. All bottles should be subjected to boiling water or steam for at least three minutes.

Finally, we would point out what we consider to be a paramount reason for special care in bottle washing. The bottles, when filled with milk, are delivered to all kinds of customers, in all types of houses or stores, from the best to the worst, and from the cleanest to the dirtiest. The hygienic conditions prevailing must, in some cases, be highly questionable; the bottles are subsequently collected by the milk distributor and are, of course, returned to his establishment direct from the house or store in which they have for a longer or shorter time been kept.

Thus the bottle, as no other milk utensil, is exposed to conditions and possibly risks of which the milk dealer knows nothing. Most emphatically, therefore, before these bottles are again used for the purposes of milk distribution they should be cleansed and sterilized in a manner which allows of no possible doubt as to their bacteriological cleanliness.

The crates, also, in which the bottles are conveyed should be subjected to cleansing operations of more frequent occurrence and of a more effective nature than is commonly the case.

An incubator with its newly-hatched batch of chicks.

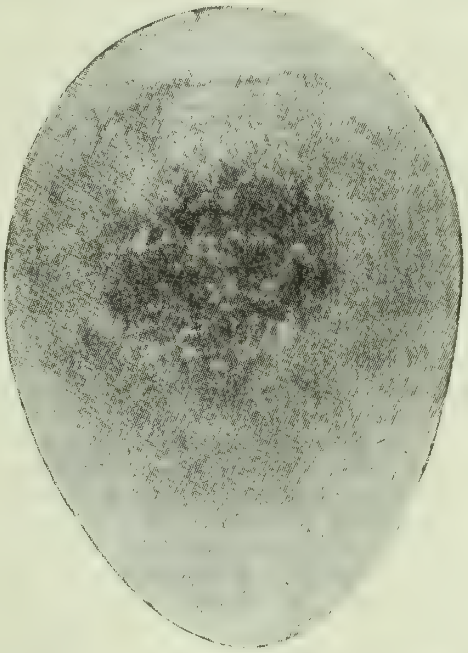
is taken in and carbon dioxide is thrown off. It seems that an excess of carbon dioxide is detrimental to the best development of the embryos. For good results the eggs must be given fresh air, and the circulation of the air through the incubator chamber should be rapid enough to supply sufficient oxygen for the living embryo. Some incubators are supplied with automatic ventilation. With those incubators which are equipped with ventilating devices, the ventilators should be kept closed during the forepart of the hatch and gradually opened as the hatch proceeds.

Moisture

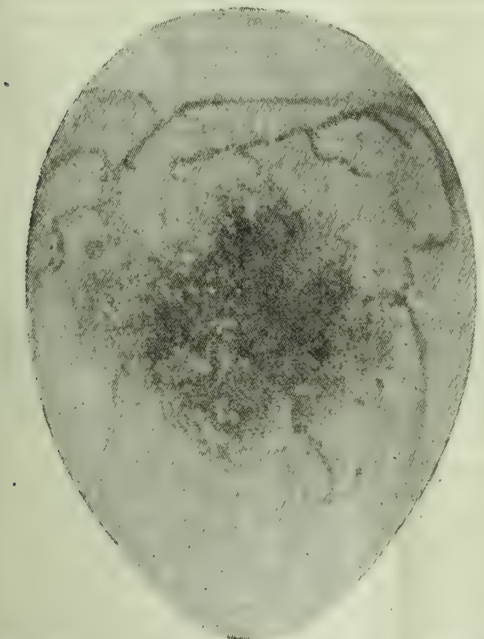
If the ventilation is too rapid the eggs will lose much moisture. Where the evaporation of the watery content of the egg is excessive, moisture must be supplied. It seems best to supply moisture from the beginning. Some incubators are equipped with moisture trays, while in others a shallow pan or dish may be filled with water and set in the bottom of the incubator chamber.

Testing the Eggs

The germ in a fertile egg will show signs of development when incubated for a few hours. On the fifth or seventh day the germ has developed sufficiently to distinguish a fertile egg from an infertile one. An infertile egg shows no signs of development during incubation.



Showing an infertile egg. No development has taken place. Note the size of the air space in the large end of the egg.



Showing a fertile egg on about the seventh day of incubation. The head and body features are quite well developed. Blood vessels extend into the albumen.

To determine whether an egg is fertile or infertile, it is tested with the egg tester or candler. The condition of the egg may be seen when the egg is placed between the light of the tester and the eye.

Testing is done usually on the seventh and again on the fifteenth day. The first test is for the purpose of testing out all infertile eggs and "blood rings." "Blood rings" are eggs in which the germ has died during the early part of incubation. The purpose of the second test is to eliminate from the incubator all dead germs, those embryos which have died after the first test.

While the chicks are hatching it is wise to keep the incubator chamber dark, this will tend to keep the chicks quiet and they will not be inclined to crowd to the front of the incubator. The chicks should not be removed from the incubator until several hours after the last chick has hatched.

The flame of the lamp should be gradually lowered while the chicks are hatching, for they give off considerable body heat. If the chicks start to pant, open the door of the incubator a little to give ventilation. While the chicks are being held in the incubator, the temperature should be lowered gradually, as in this way the chicks are prepared for the brooder.

Every incubator should be disinfected with a ten per cent. solution of a good commercial disinfectant before and after every hatch.

M. A. JULL

Showing a fully formed chick in the shell after twenty-one days of incubation.

SEASONABLE POULTRY NOTES

IN order to secure a good percentage of fertile eggs it is necessary to mate the birds some time before the eggs are needed. This should be done at least two weeks before starting to hatch. Keep a few extra birds on hand for changing in the breeding pen. Alternate the male birds every week or two, and the results should be better.

For Plymouth Rocks, Rhode Island Reds, Wyandottes and other similar breeds, one male should be mated with about ten females. For the lighter breeds as Leghorns one male may be mated with ten to fifteen females. Brahmas and other meat breeds should be mated in the proportion of one male to six or eight females.

A good percentage of fertile eggs may be expected up to about two weeks after the male birds have been removed.

Eggs intended for hatching should not be held longer than two weeks before being incubated. The sooner, after they are laid, that hatching commences the better.

The hatching power of a hen seems to be inherited, while fertility is not. There is no apparent correlation between egg production and fertility, but there is between hatching quality and egg production. A heavy winter egg production is usually followed by a low hatch. On the other hand if the breeders have not laid well during the winter months their eggs will usually produce the strongest chicks in the spring of the year.

The poultry house and surroundings should be kept neat and clean at this time of the year particularly. With the coming of spring the lice and mites begin to feel their oats, and if the house is not thoroughly disinfected every two weeks they will increase rapidly. Lice and mites are easier to raise than chickens but are not as profitable.

ONE THOUSAND BABY CHICKS.

TO SET A SITTING HEN

WHEN a sitting hen sits well upon a setting of eggs on which you have set her, would you expect a good hatch? Yes, but you should not count your chicks before they are hatched.

If you want good success in natural incubation get good hens and give them a good chance. Medium sized hens of the American breeds are among the best sitters and they should have the broody instinct well developed. Each hen should be large enough to cover 13 or 15 eggs comfortably, but she should not be awkward.

The nest should be carefully built of fine soft straw or hay, and of such size and shape that the hen will fill it nicely, affording complete protection for the eggs. Although the nest should be reasonably flat on the bottom, care should be taken to prevent the eggs from coming in contact with the floor. The nest should be placed in such a position that the hen will not have to fly or jump into it. If it is placed on the floor there will be little danger of broken eggs. A sod of grass turned upside down makes a fine bottom for the nest. Do not make it so deep that eggs will pile up on top of one another, as they are sure to break.

All brooding should be done in a quiet secluded place where the hens will not be disturbed. If convenient, a number of hens can be set at the same time and the chicks can be given to a few and the rest placed in the laying pen. Where a number of hens are set in the same room care should be taken to see that they are fed regularly and that they each return to their proper nests.

By all means dust the hen with good dusting powder before setting her and once again while she is hatching. This is important, as lice and mites play havoc with little chicks. Give the hens plenty to eat and fresh clean water. Feed hard grains, wheat, corn, or oats, or these mixed, and do not feed wet mash.

When the chicks begin to hatch the hens should be watched carefully. Do not disturb them any more than is absolutely necessary, and if one chick should hatch early he should be watched. If he gets out of the nest the hen may leave the nest to cover the chick, thus losing more than she gains.

M. A. JULL.

BREEDING FOR EGG-PRODUCTION

Laying Ability is Inherited Through the Male Parent

Lecture by Dr. Raymond Pearl, Biologist, Maine Agricultural Experiment Station.

IT is safe to say that never has there been so keen and widespread an interest in the improvement of poultry in respect to egg production as exists at the present time. All over the world poultry keepers are waking to the fact that some hens lay more than others; that it costs no more to hatch, rear, and care for those which lay more; and that they want this sort in their flocks.

There would seem to be little doubt that this awakening is due in considerable degree, at least to the rapid development during the last ten years of egg-laying contests in different parts of the world. We are indebted for the inauguration of such contests on a large scale to the enterprise of the Australians. In recent years we have seen their development in this country. It seems likely that we shall see a much further growth that we shall see the idea grow in the United States, as well as in European countries. To be sure some of our friends see little or nothing of value in laying tests of any sort, have been predicting that the laying competition has about run its course, and that the end is now in sight; that we are, in point of fact, witnessing its last decline before utter extinction. Unprejudiced obesrvation, however, would seem to indicate that these contests make a strong appeal to the poultry public. It is difficult to conceive of any single measure better calculated to arouse general interest in poultry-keeping, and to call attention to the results which follow good care and good breeding. In other words, the educational value of laying, the educational value of laying contests would seem to be beyond question. That they can be conducted as to contribute to existing knowledge of the laws of egg production also is beyond doubt. I have recently had the opportunity of examining the detailed plans for the conduct of a series of such laying competitions, which are to be undertaken, with government subsidies, in two European countries. There can be no question that these plans, if carried out, will contribute materially to scientific knowledge of the laws of egg production.

Underlying the immediate stimulus afforded by the laying contests are to be found two fundamental reasons for the present interest and activity in the direction of improving egg-production. These are:

(a) The poultryman's belief that egg-production is an inherited character. In holding this opinion he is certainly quite correct. One might, indeed, say "knowledge" instead of "belief" here.

(b) His belief that any character which is inherited is capable of improvement by intelligent breeding. Again, this belief is entirely well founded, provided that an exception be made for characters (if there be any such) in which all possible improvement in innate hereditary conditions has already been made.

HEREDITY AND EGG-PRODUCTION

To say, as we have above, that "egg-production" is an inherited character is not quite enough. This might be taken to mean only the fact that the mode of reproduction characteristic of birds—which is to say reproduction by means of eggs with albuminous and calcareous envelopes —is an innate and hereditarily fixed matter in the fowl. But the poultry man is interested, as well as the investigatar in the field of genetics, in something more than this. He wants to know whether the differences which he observes in egg-laying capabilities amongst different breeds, or flocks, or finally individuals, are inherited. General observations indicate foundation of a great many of these differences in laying ability with which he is familiar is gereditary. But how? And under what limitations? For plainly this is not a simple matter. If it were, none of our hens would ever lay less than 200 eggs per annum, except in the case of remote back regions, where the gospel of the trap-nest had not yet penetrated. Trap-nest selections of high producers has opened the eyes of the poultryman to one thing certainly, even though it may have obscured his vision in other directions. This thing which is clearest is that high producing hens are not equally capable of transmitting this valuable quality to their progeny. So that while it may be perfectly certain that the difference between a 200-egg producer and a 50-egg producer is in some way or other a hereditary difference, we shall not get far toward a practical ultilization of this fact until we know something more about its nature.

So, then, the first essential step to be taken towards the improvement of egg-production by breeding is to find out the way variations or differences in producing ability are inherited.

For some six years past I have deveted considerable attention to this problem, with results which have been set forth in detail in a series of papers from the biological laboratory of the Maine Agricultural Experimental Station.

First as to facts: The following are simple statements of the actual results obtained in trap-nesting Barred Plymouth Rocks and Cornish Indian Game, and all possible sorts of crosses between these breeds, over a period, collectively, of nearly fifteen years. The total number of birds involved in these trap-nesting operations has been large, aggregating, all told, between fipe and six thousand individuals. Out of these, the following facts clearly appear:

1. The record of egg-production of a hen, taken by itself alone, gives no definite, reliable indication from which the probable egg-production of her daughters may be predicted. Furthermore, mass selection on the basis of egg-laying records of females alone, even though long continued and stringent in character, failed completely to produce any steady change in type in the direction of selection.

Differences in egg-producing ability are, in spite of the above results, certainly inherited. There are two lines of evidence showing that this is the case. The first is that derived from general observation that there are widely distinct and permanent differences— (under ordinary breeding) —in respect to egg-laying ability between different breeds of fowls and between different strains within the same breed. In the second place, a study of pedigree records of poultry at once discovers pedigree lines in each of which a definite, particular degree of egg-producing ability constantly re-appears generation after generation, the "line" thus "breeding true" in this particular. With all birds kept under the same general environmental conditions such a result can only mean that the character is in some manner inherited.

3. The number of visible oocysts on the ovary bears no definite or constant relation to the actually realized egg-production.

4. This can only mean that observed differences (variations) in actual egg-production depend upon differences in the complex physiological mechanism concerned with the development of oocysts and the body (laying).

WINTER EGG-PRODUCTION

For reasons which cannot be gone into here on account of lack of time, attention has been focused during the latter phases of my study on winter egg-production. From this point on we will, therefore, remember that we are confining the discussion to winter egg-production.

5. It is found to be the case that birds fall into three well-defined classes in respect to winter egg-production. These include (a) birds with high winter records, (b) birds with low winter records, and (c) birds which do not lay at all in the winter period; the division point between a and b for the Barred Plymouth Rocks used in these experiments falls at a production of about thirty eggs.

The next step is to inquire for each of these classes separately how egg-producing ability is inherited within the class. We may first deal with high production.

High productiveness may be inherited by daughters from their sire, independent of the dam. This is proved by a mass of detail concrete evidence, presented in the complete paper. This evidence consists of the result of mating after mating, in which the same proportions of daughters of high laying ability are produced by the same sire, whether he is mated with dams which are poor layers or with dams which are high-layers.

7. High-laying ability is not directly inherited by daughters from their dams. This is proved by a number of distinct and independent lines of evidence, of which the most important are: (a) that continued selection of high.producing dams does not alone alter in any way the mean egg-production of the daughters. If an alteration does appear in any case following such selection further analysis shows that some additional element other than the dam's egg record came into account in making the selections of the breeders. (b) The proportion of high-producing daughters is the same whether the dam is of high or low fecundity, provided both are mated to the same male; (c) the daughters of a high-layers or poor-layers, depending upon their sire; (d) the proportion of daughters which the medium or poor-layers is the same whether the dam is a high or a poor-producer, provided both are mated to the same male.

8. Mediocre or poor-laying ability may be inherited by the daughters from either sire or dam, or both.

Now, all these eight points are merely statements of facts. They are the results which any intelligent person who examined our extensive trap-nest and pedigree records would reach. I can assure those to whom Mendelism is as the proverbial red rag to the bull that nothing which has been said so far is even to the slightest degree tainted with this dreadful doctrine.

An isolated fact does not alone contribute to the body of organized knowledge known as science. Its relation to other facts must be understood. Now, the facts regarding egg-production which have been set forth above, do, as a metter of fact, accord in a remarkably clear manner with a Mendelian interpretation of the inheritance of fecundity in the fowl. In this way we are better able to understand (in the light of present knowledge) the meaning of our facts, and on this basis, makeplans for investigations which shall take us again a little farther into the realm of the unknown, beyond the boundaries of our present knowledge.

NO RULE-OF-THUMB IN POULTRY BREEDING

But what is the good of all this? how is it going to help John Smith to win first prize in an egg-laying competition? It must be said at the outset that, much to my regret, neither the facts nor their Mendelian interpretation will furnish any neat little rule-of-three where all John Smiths can win all first prizes. Successful poultry-breeding will continue in the future as it has in the past, to demand a lot of intelligence, thought, skill and rationally directed effort. I hope and believe, however that the results discussed above may be of some help in efforts to improve egg-production by breeding. It is farthest from my desire to claim too much for them, but I do think they help us a little in certain general directions. In the first place these results, by showing that the inheritance of egg-producing ability is not a simple uncomplicated transmission of something from dam to daughter without change, make it somewhat easier to bear the disappointment which attends devotion to the gospel of trap-nest, in its original inspirational form. In the second place, they help us to make a more just and adequate distribution of emphasis on the different basic elements of a systematic plan for the improvement of poultry in egg-production. Finally by furnishing a generalized mode of interpretation of observed results, or in other words, by giving a clearer and broader understanding of how egg-production is inherited, these results help us to interpret, and profit in our own breeding operations by the experience of others.

It would be very easily possible to make out a system of matings, on the basis of the results of bulletin 205, showing in great detail how to proceed toward building up a laying strain—indeed, such specific plans have been worked out by a number of my friends. I have refrained from doing this, however, because it seems to me to be of doubtful practical utility. Lest I should seem to be repudiating both my results and my friends, let me hasten to give my reasons for this doubt. The reasons are general in character and are found in the fact that such schemes of mating are essentially mechanical, whereas both the things to be bred in accordance with the scheme (the fowls), and those who are to carry out the plans (the poultryman) are essentially living. Perhaps in final analysis the basis of life may be mechanistic, but certainly living things do not in practical every day life behave with the precision and definiteness which we expect from a machine. Being a little acquainted with the frailties of both poultry and poultrymen, I am not too optimistic as to the outcome of trying to breed chickens by formula.

PRINCIPLES IN IMPROVEMENT

It seems to me that it may be more helpful to try to draw from these results some general principles in breeding for egg-production which every poultryman can apply. What, then, are the basic elements in a well-directed effort towards the improvement of poultry in egg-production by breeding? I should put them in this way:

1. Selection of all breeding birds first on the basis of constitutional vigor and vitality making the judgment of this so far objective as possible. In particular the scales should be called on to furnish evidence. (a) There ought to exist, for all standard breeds of fowls, normal growth curves, from which could be read off the standard weight which should be attained by a sound vigorous bird, not specially fed for fattening, at each particular age, from hatching to the adult condition. These curves we shall sometime have. (b) Let all deaths in shell, and chick mortality, be charged against the dam, and only those females used as breeders a second time which show a high record of performance in respect to the vitality of their chicks, whether in the egg or out of it. This constitutes one of the most valuable measures of constitutional vigor and vitality which we have. If for no other reason than to measure this breeding performance, a portion of the breeding females each year should be pullets. In this way one can in time build up an elite stock with reference to hatching quality of eggs and viability of chicks. (c) Let no bird be used as a breeder which is known to have been ill, to however slight a degree. In order to know something of this, why not put an extra leg-band on every bird, chick, or adult, when it shows the first sign of indisposition. This then becomes a permanent brand, which marks this individual as one which failed, to a greater or less degree, to stand up under its environmental measures of constitutional vigor. (d) Many of the bodily stigmata by which the poultryman, during the last few years, has been taught to recognize constitutional vigor, or its absence, have in my experience, little if any real significance. Longevity is a real and valuable objective test of vigor and vitality, but it is of only limited practical usefulness, because of the increasing difficulty with advancing age of breeding successfully on any large scale from old birds of the American and other heavy types.

2. The use as breeders of such females only as have shown themselves by trap-nest records to be high producers, since it is only from such females that there can be any hope of getting males capable of transmitting high-laying qualities.

3. The use as breeders of such males only as are known to be the sons of high-producing dams, since only from such males can we expect to get high-producing daughters.

4. The use of a pedigree system, whereby it will be possible at least to tell what individual male bird was the sire of any particular female. This amounts, in ordinary parlance, to a pen pedigree system. Such a system is not difficult to operate. Indeed many poultrymen, especially fanciers, now make use of pen pedigree records.

5. The making at first of as many different matings as possible. This means the use of as many different male birds as possible, which will further imply small matings with only comparatively few females to a single male.

6. Continued, though not too narrow, inbreeding (or line breeding) of those lines in which the trap-nests records show a preponderant number of daughters to be high producers. One should not discard all but the single best line, but should keep a half dozen at least of the lines which throw the highest proportions of high layers, breeding each line within itself.

Items 4, 5 and 6 imply the carrying over of a considerable number of cockerels until some judgment has been formed of the worth of their lives, through the performence at the trap nest of their sisters.

Item 6 assumes, as an absolutely necessary prerequisite, that item will be faithfully and unfailingly observed.

APPLICATION OF THE PRINCIPLE

The whole system of breeding here outlined is an application, in the simplest form possible, of two principles, one general and the other special to the present case.

The first is the general principle of the progeny test in breeding for performance. This the principle which has led the plant breeder to such notable triumphs during the last fifteen years. In my judgment no system of breeding for performance in animals not fundamentally based upon it will ever achieve any permanent success. The second principle is the recognition of the significance of the male in breeding for egg-production. It has been the custom in trap-nesting work to

WOMAN'S WORLD

THE NOON HOUR AT SCHOOL

WHAT do the mothers of to-day know of the "noon hour at school" in their respective communities? Those who have no children in attendance probably know nothing, and those who have may know little more, and yet this "noon hour" is a fact, and a grave fact.

When parents look back to their own school days they must vividly recall memories of this hour, many of which are distasteful and not a few positively unpleasant.

In the home parents strive in every way to inculcate in their children right habits of life and to make the environment wholesome and helpful. The child's conversation and all his activities are influenced by the home. He is assisted in the choice of friends by his mother.

When the call for "education" comes there is a change. Many children in cities and rural districts leave home after breakfast not to return until the close of the afternoon session, and the *school* becomes responsible for the child practically five days out of seven.

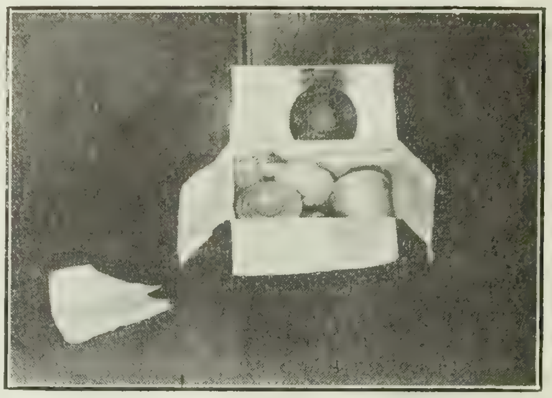
A Cosy Farm Home. Attired in its Winter Garb.

Have you ever asked yourself these questions—What supervision have my children at the lunch hour? Where is the school lunch eaten? What are the habits of the children who take their lunch? Is it possible my child is hearing in the wrong way facts which only his parents should explain?

In the best school I have visited the relation of the teacher to the noon hour had not reached a higher ideal than that of police duty. The idea was to keep the pupils out of mischief, or rather maintain "quietness". Have all schools even this supervision?

The noon hour at school should have an educational value just as the other school hours, and the cultural possibilities of this noon time intermission are very great.

The growing emphasis which is being placed upon the value of the informal education of the schools—that which is given silently by the surroundings of the child and which is efficacious in the formation of cleanly and healthful habits and of good taste—makes it seem desirable that any food which the child takes in the school building, even if it is taken from a lunch-box, should be so served as to contribute to his training.



The Lunch Box for Pupil.

We talk very much and perhaps fancifully of the "larger homemaking" and "municipal housekeeping." There is danger perhaps of using the terms without grasping their real significance and importance. There are certainly, however, many problems which vitally affect the welfare of children which cannot be settled by individual women in their separate homes. They call for the co-operation of all the women of a community. It would seem as if the first duty of the "larger homemaking" was in connection with the feeding of children.

Could the Homemakers' Clubs in the Province of Quebec find a more urgent, a nobler or more profitable field of service than that afforded by the "noon hour in school?" We can think of no object more worthy of our highest endeavors than that of child nurture to the end of securing the highest efficiency of the responsible adult citizen.

Communities which are striving to perfect this work report most interesting results. In place of lunches of slabs of bread eaten with unwashed hands from a paper bag in solitude, attempts were made to make the lunch a means of social training by sitting at table, with paper napkins and lunch attractively arranged and with one hot dish—soup or cocoa,—cooked at school. The improvement in table manners was rapid, as well as the quality of the lunch. An improvement in the quality and neatness of the clothing was apparent. On account of this hot addition to the otherwise dry, cold luncheon the children were brighter and worked much better. Children from the poorer homes dispensed with newspaper lunches. They also provided themselves with soap and one clean towel a week. The seat on the shady side of the school house was deserted by the "quiet children", who were busy preparing for or preparing their luncheon. The boys spent these minutes in their little kitchen garden where the potatoes, carrots, peas and onions were grown for the noon hour soup. The time spent in actual lunch eating was delightful. With neat hair and clean hands and face, each child seated itself at his desk which he had prepared for the meal. A white paper napkin served as tablecloth, another for napkin. The contents of the lunch box were carefully arranged and then the hot course was placed before each child by the steward for the day or week. Proper habits of eating, careful chewing, neatness, thoughtfulness to others were some of the lessons learned. At the end of a very short time each child of eight years and upwards had prepared and served the hot dish for the day. These were dishes of course which the teacher had prepared several times during the little talks on nutrition. In this way an opportunity is afforded for co-operation between homemakers and shool authorities, or even better, a chance for the pupil to make practical application at home of instruction given in school.

The Lunch spread on Desk.

The only equipment necessary for the preparation of a hot dish is two large saucepans, (or better, one large sauce pan and one double boiler,) one vegetable knife, one tin measuring cup, one tablespoon, one teaspoon, one wooden spoon, two large enamel or porcelain bowls and one vegetable strainer. The cooking could be carried out easily on the box stove or other heater in use in any rural school.

A small cupboard would be necessary with two doors which close tightly and lock. In this are kept the cups, spoons, plates and forks for the children who share in the noon hour lunch, also white paper napkins which are purchased by the hundred. One shelf should be reserved for labelled storage jars, salt, pepper, flour, butter, sugar, and cocoa being all that is necessary.

Six dish towels, six dish cloths, six scrubbing cloths, six flannelette dusters would be sufficient linen for one year in the average rural school.

Two enamel dishpans and one good soap shaker would complete this equipment.

At the present time there is need of a different attitude toward food itself in order that its relation to education may become more clearly defined. That the Homemakers' Clubs will promptly institute a much needed reform along these lines, and that those schools which are close to the source of educational ideals and which are comparatively free to put ideals into practice, will one day, and it cannot be too soon, present to us a model noon hour at school is the sincere wish of every right thinking mother.

E. B. RUTTER

Macdonald College.

---

reckon pedigrees in the female only. This we can now see to be an essentially futile procedure, so far as concerns the daughters. To say that "this pullet is the daughter of Lady Splendissima (with a tremendous record") is perhaps good advertising. It, however, conveys no information of any special value to the breeder, until he knows who was the Lady's consort in this particular reproductive venture.

In closing, let me express my conviction that the plan of breeding for egg-production set forth, which involves nothing in principle or practice which any poultryman cannot put into operation will not fail, if consistently and intelligently followed for a period of years, to bring about a material increase in the productiveness of the flock. The evidence leads me to this: conviction is the best of all evidence; I have tried it.

The JOURNAL of AGRICULTURE

AND HORTICULTURE

Volume 18 *April 1st 1915* *Number 10*

SPRAYING FRUIT TREES WITH LIME-SULPHUR MIXTURE BEFORE THE BUDS OPEN.

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

Start Now to
RaisePoultry

THE [illegible] first grade poultry and eggs in Canada and Europe is far short of the demand. Get busy right now and benefit by obtaining the year's top market prices.

We will shew you how to begin, help you after you start and wil' buy for the highest cash price all the poultry and eggs that you can produce.

In selecting your incubator make sure that you get the best that money can buy — it will prove cheapest in the end.

Prairie State Incubators

are guaranteed to be absolutely as represented or your money will be refunded upon return of incubator in good order.

Canadian Agricultural Colleges are using Prairie State Incubators; write them for their results. Hundreds of others, beginners and experts, are having great success in hatching strong, healthy "chicks that live."

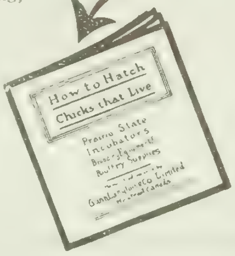
SEND FOR OUR FREE BOOK.

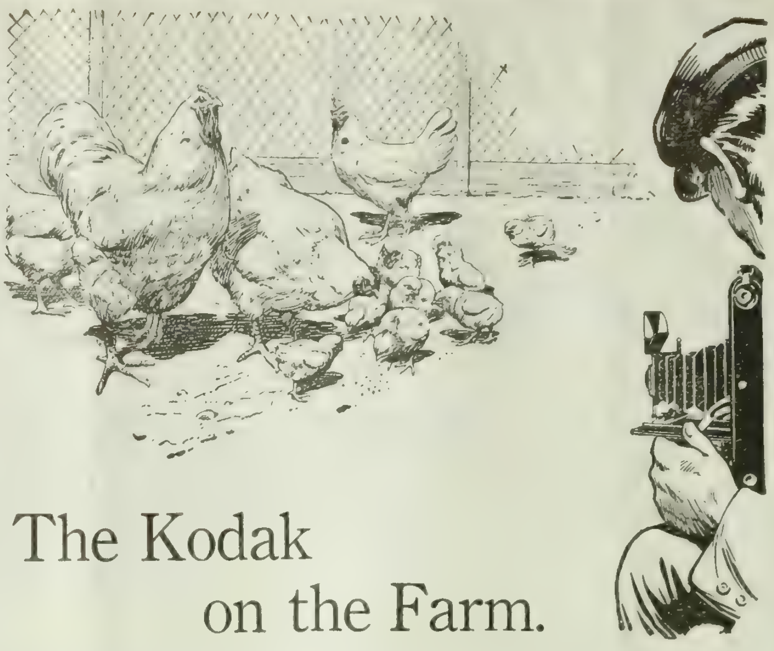
"How to Hatch Chicks that Live"

It gives reasons why the Prairie State is best—shows the right kind of hover—tells how to build your own brooders — the kind of feed to promote quick growth, and how to obtain the experiences of successful poultrymen. Write for it today.

GUNN, LANGLOIS & CO. LIMITED

6 ST. VINCENT STREET, MONTREAL.



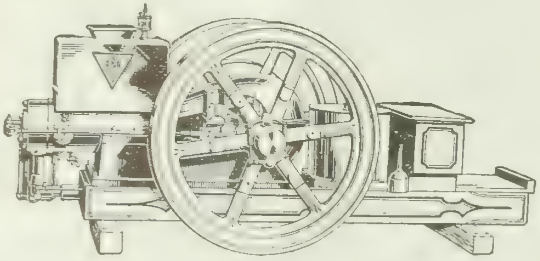


The Kodak
on the Farm.

EVERY live thing on the farm is worth a photograph—and just now when chicks and lambs and calves are arriving so rapidly is a most interesting time to start a Kodak record — such a record often becomes more than interesting, it becomes a business asset.

Picture taking is very simple by the Kodak method and less expensive than you think. Ask your dealer or write us for our new booklet, "The Kodak on the Farm."

CANADIAN KODAK CO., Limited, 604 King St. W., Toronto.



Alpha Engine Facts

Alpha Engines are reliable. Use all fuels. Are easy to start. Develop full power. Are free from vibration. Have best pulley arrangement. Have simple, reliable ignition. Are thoroughly standardized and parts are interchangeable. Strictly modern in design. Are high-class in appearance. Will fit your needs for size and equipment. Make best showing when directly compared with other engines. Are sold and backed by a Company that has a world-wide reputation for selling only high-quality machines and equipment.

An ideal engine for farm use

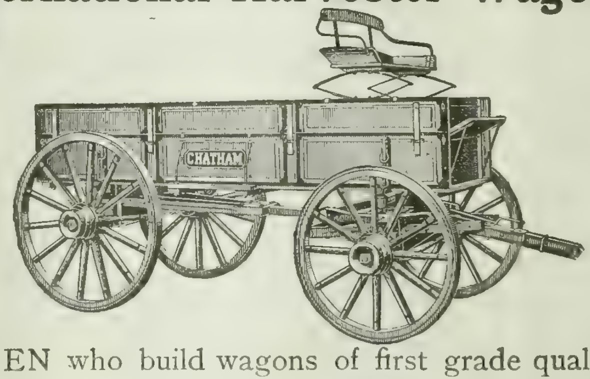
Eleven sizes, 2 to 28 horse-power. Each furnished in stationary, semi-portable, or portable style, and with either hopper or tank cooled cylinder.

Every farmer needs an "Alpha." Send for catalogue.

DE LAVAL DAIRY SUPPLY CO., Ltd.

LARGEST MANUFACTURERS OF DAIRY SUPPLIES IN CANADA

MONTREAL PETERBORO WINNIPEG VANCOUVER



International Harvester Wagons

MEN who build wagons of first grade quality, throughout, work for a reputation. To many buyers all wagons look alike, nor is it possible even for an expert always to pick the better wagon of the two after a wagon is put together and painted.

This is why a good reputation is a most valuable asset to a wagon. Their good reputation practically assures the buyer that he will get his money's worth in a **Petrolia** or **Chatham** wagon.

In order to keep the reputation of the **Petrolia** and **Chatham** wagons up to the point where it belongs, all wood used is carefully selected, and then air-dried under cover. The lumber dries for at least two years, most of it three years, some of it —particularly the pieces for the hubs, which receive special attention—even longer. Air-drying produces tough wagon lumber because the sap dries naturally with the wood and binds its fibres together. It is this right drying of good wood which gives **Petrolia** and **Chatham** wagons the qualities necessary to live up to their reputation.

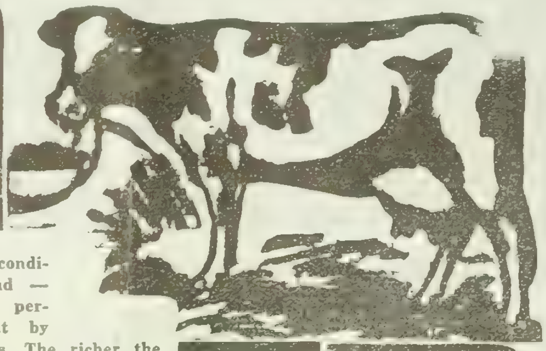
I H C local agents can furnish you with catalogues giving a great deal of valuable information about these wagons. If you had rather get it direct from us, drop a card to the nearest branch house.

IHC MACHINES
Made in
Canada

International Harvester Company of Canada, Ltd.

BRANCH HOUSES

At Brandon, Calgary, Edmonton, Estevan, Hamilton, Lethbridge, London, Montreal, N. Battleford, Ottawa, Quebec, Regina, Saskatoon, St. John, Winnipeg, Yorkton



This Feed
Costs Nothing

If you count the results it gives.

Livingston's Oil Cake is just what cows need.

It tastes good—is easily digested — keeps stock in prime condition all the year round — actually increases the percentage of Butter Fat by 16% over Pasture Grass. The richer the cream, the more money you make. Livingston's is the feed that pays for itself. 10

Write for free sample and prices. Dominion Linseed Oil Co., Limited, 31 Mill Street Montreal.

Livingston's Dairy Oil Cake

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE
AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 100,595
ENGLISH, 9,840
FRENCH, 90,755

Volume 18
APRIL 1st 1915
Number 10

EDITORIAL

AGRICULTURAL MERIT COMPETITION FOR 1915

District No. 1.—Official Notice

THE Agricultural Merit Competition will take place this year in District No. 1 of this province, including the following counties:—

Jacques Cartier, Hochelaga, Laval, Two Mountains, Soulanges, Vaudreuil, and the parishes and townships of Argenteuil and Terrebonne counties which are not included in the Laurentides.

Farmers wishing to take part in this competition may make application to the Minister of Agriculture, Quebec, from now up to the 15th June at the latest, on forms to be supplied by the Minister for that purpose.

No applications received later than June 15th will be considered.

Winners in this district of the Silver Medal and the diploma of Very Great Merit in 1910 are reminded that they have the right to compete this year for the Gold Medal and the Diploma of Highest Merit.

NEW LEGISLATION RELATING TO AGRICULTURE

AT the recent session of the Provincial Legislature the laws governing agricultural associations, farmers' clubs and co-operative agricultural societies were amended in certain details, extensive alterations were made in the law relating to the Provincial Dairy Association and a new law was adopted which authorises municipal councils to purchase seed grain or seeds for the use of ratepayers this year. This latter law reads as follows:—

1. The council of any rural municipality or any county council governing a territory not erected into a local municipality, or whose council is not yet organized, may, during the year 1915, by resolution passed by the majority of the members of such council, take, out of the funds of the municipality not otherwise appropriated, or borrow, upon note or otherwise, the sums necessary for the purchase of seed grain or seeds which may be needed by the retapayers of such rural municipality or such territory not erected into a local municipality or whose council is not yet organized, as the case may be.

2. The ratepayers who benefit by the distribution of such seed grain or seeds shall be bound to repay to the municipality making such distribution, the proportion of the price thereof represented by the quantity of seed grain or seeds received by each ratepayer as his share respectively.

Such repayment shall be made according to the terms and conditions fixed by the council.

3. The general or special laws governing the borrowing power of a municipality to which this act may be applicable, shall not apply to the loans contracted in virtue thereof; and the said loans shall not in any way affect the limit of the borrowing power of such municipality".

4. This act shall come into force on the day of its sanction.

THE NOTES OF SPRING

APRIL—the month of Opening — is here, and Nature, who has been sleeping for the past four or five months, again awakes under the warm kiss of the sun. The buds open, the leaves unfold, the birds return, and all life throbs with the quick rush of the ascending sap and the joyous flow of quickened blood.

The dominant notes of Spring are this reawakening of Nature, and the preponderance of young life,—life in its multiplication stage. After the death-like slumber of winter the abundance of life in spring strikes the observer as marvellous. In a few weeks the trees and shrubs will be in full leaf, and the streams and ponds will be re-populated with swarming myriads of tiny water-babies. Insect life, too, is stirring in the soil, and from the mummy-like pupae will emerge the butterfly, the moth and other winged forms to start new cycles of strange caterpillars and grubs, some injurious, some beneficial to man and his crops.

But Spring would be dull if it were not enlivened by the songs of birds that have come to our northland to rear their broods. Disastrous for us would it be too if birds failed to appear, for they are the main agents in keeping the insects in check. This clash of the two great classes of successful fliers is the most important conflict the world knows from a practical standpoint.

BEWARE OF CLODS

WE have all had experience with clods in preparing land, especially clay land, for seeding. In our eagerness to get on the land in the spring we are sometimes tempted to begin cultivation before the soil is dry. The soil does not crumble down evenly, but forms large hard-lumps. These are clods, and they take no part in the feeding of the young plants because the roots cannot penetrate them. Besides, they tend to dry out the soil by allowing too free access of air. It is impossible where clods are present to get that fine surface soil mulch which is so essential in conserving moisture. In fact a cloddy soil invites crop failure.

The question naturally arises—What can we do with clods when they are once formed? In some clay lands these clods are hard to break down and no amount of work can entirely remove them. In other kinds of soil clods are more easily treated. Harrowing is usually not sufficient, and some device is necessary to crush them. Some farmers use a log or plank roller, but, unless the ground is very level and even, low sports are left untouched. More up-to-date implements are now on the market which do excellent work in crushing the clods.

The point we desire to emphasise is the great loss to a crop when clods form and the need for care in the preparation of the land. One acre properly prepared will yield more than two acres seeded in poor condition. It requires a little more energy to prepare it properly, but it is time well spent as every good farmer will tell us.

CARE OF THE ORCHARD AND GARDEN

IT is a matter of common observation that most orchards and gardens are not cared for properly, yet perhaps no labour is so amply rewarded as that given to the production of fruits and vegetables on the farm. As a rule one will find more fruit and vegetables on the table of the city man than on that of the farmer.

The reason for this relative absence of refreshing, palatable and wholesome food from the farmer's table is often obvious. Too frequently the planting and care of the garden are left to the women folk of the home, who are already over burdened with other cares. Too frequently the garden plot is not even plowed in the fall, and as a result the preparation of the ground is greatly delayed.

The men folk are inclined to leave the orchard and garden work until everything else is attended to first—but then it is usually too late. If they realized fully how much pleasure it would give the women folk to have a plentiful supply of fresh vegetables for the table we feel sure they would take more interest in the garden.

In another column will be found articles dealing with the farm garden and the orchard which will make profitable reading.

SPRING WORK

THE extent and nature of farm work in spring determines of course the whole year's operations. We might go farther back and say that the work of the previous autumn determines the extent of the spring's operations. Two or three factors must be borne in mind if the largest returns are to be secured. First, both experiments and experience bear out the importance of *early seeding on well prepared land.* Bigger and better crops are the result. Even on drained land the removal of surplus standing water can sometimes be hastened by breaking down the little dams that hold the water back in small ponds. A little attention to this point may permit seeding two or three days earlier than usual in some fields.

CONTENTS

EDITORIAL.—Agricultural Merit Competition for 1915; New Legislation relating to Agriculture; The Notes of Spring; Beware of Clods; Care of the Orchard and Garden; Spring work; The Farmer and the War; Better Methods of Marketing.

ORCHARD AND GARDEN. — The Spraying Campaign for 1915; Lime-sulphur Spray; Bordeaux Mixtures; Hot Beds and Cold frames; Strawberry Culture; Plans for Kitchen garden; Planting Tables.

FARM AND FARM CROPS. — Standing Crop Competition; Seed Improvement in the Province of Quebec in 1914; Ensilage Corn production; Practical Advice to makers of Maple Sugar and Syrup; No shortage of wheat in Canada!; Agricultural Values in 1914; Cereal Crops on the Experimental Farms; Nitro-cultures; Roots.

LIVE STOCK. — New Book; Cookshire Short Course in Agriculture—March 1st-6th; Sheep in Compton County; General Stock Breeders' Association of the Province of Quebec; Co-operative Marketing of wool (continued); Feeding of Mouldy Silage is dangerous; Raising Calves; Official Records of Holstein-Friesian Cows.

DAIRY. — Some Suggestions regarding the care of Milk and Cream in the Home; Huntingdon Dairymens' Association.

POULTRY. — Preservation of Eggs; Hatching the Chicks; Little Chicks.

WOMAN'S WORLD. — Foods and Food Preparation; The Children's Homer; "Come let us live with our children".

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

Second, yields at harvest-time depend not only upon early seeding and good condition of the soil at seeding-time but also upon the *quality of the seed sown*. Only the best varieties should be planted, and these should in every case be clean and selected. Besides, seed oats should be treated with formalin solution a few days before seeding time according to directions given in our last issue.

We would like to see a bumper crop this year, and although the weather is beyond the control of man yet by good farming a fair crop can often be secured in an unfavourable season.

Third, success depends upon *readiness* to do the right thing at the right time. More failures in farming have come as a result of unpreparedness than probably any other factor. The horses should be in condition for hard spring work; the harness, plows, cultivators, disk-harrows etc. should be in perfect order to begin work, and the seed grain should be cleaned and ready for sowing.

THE FARMER AND THE WAR

THERE seems to be an impression among town and city people that war conditions are favourable for the farmer. Let us hear, however, what the farmer has to say about profits in war time. The price of milk remains about the same as it was last winter, but the cost of the cattle foods the dairyman has to buy has advanced from 25 to 50 per cent. The market value of beef, mutton and pork is much lower than it was a year ago, but the cost of stock foods used in fattening has gone up. The price of eggs is about the same as last year but here again poultry feed has advanced in cost.

And so we might go through the list of products made on the farm, when it will be found that the farmer, instead of making more money than usual, is actually making less.

Besides we must bear in mind that nearly all the articles the farmer has to buy, such as clothing, groceries, farm implements etc. have gone up in price.

Hay and wheat have advanced, but not many of our farmers are in a position just now to take advantage of the rise. It is interesting to note that the rise in wheat came after the farmer had parted with his crop. Unless some organized means are soon adopted to procure capable farm labor greatly increased production on the farm for the coming year can hardly be expected.

While we are in hearty sympathy with the idea of increased farm production, we are in doubt if the present campaign will bring as large an increase as was hoped for. Farmers are as patriotic as any other class of citizens, and, we venture to believe, are as fully aware of the critical nature of the great struggle being waged in Europe. That they will do all in their power to increase production we feel certain, but it is rather disconcerting for them to be compelled to listen to the appeals to patriotism, as if they above all others should be singled out.

Moreover, the farmers are beginning to feel that if increased production was very badly needed, every effort humanly possible would have been made to make increased production possible. They find, however, that no special organized effort has been made to provide them with capable labor help, or to keep down the prices of materials, fertilizers and feeds used by the farmer. The farmers feel, too, that nothing has been done to help them to get cheap money on long terms, such as would best suit their convenience.

As matters stand at present the farmer feels that the manufacturer, banker, and politician are patting him on the back and asking a sacrifice from him which they themselves are unwilling to make. He wonders how they will act towards him after the war danger is over.

BETTER METHODS OF MARKETING

Farmers Losers Through Bad Marketing System, says W. Sanford Evans

THAT more production and better means of marketing were badly needed in Canada was the argument presented to the Canadian Club by Mr. W. Sanford Evans, chairman of the Georgian Bay Canal Commission, one of the fathers of the Canadian Club movement. Mr Evans said that there was probably no aspect of practical affairs in which Canada was more deficient than in its arrangements for getting its products to market, with the result that the producers generally had to sell at the low prices, while the middlemen got the advantage of high prices and made the money the producers should have received.

"There is enormous waste throughout the Dominion every year", said Mr. Evans, "because there is no proper system for disposing of all the products of this country, as a result of which many of these products are not properly marketed, or marketed in such a way that the demand is over-supplied, and prices artificially run down for the producer".

Prices of products in Canada, he said, had fluctuated violently, and it was axiomatic in such cases that the producers got the low prices. At the same time, when prices of staple products oscillated so much, it was clear that there was something wrong with the volume of produce, or with the times and methods of marketing.

"All this is to the disadvantage of the producer", said Mr. Evans, "and in a producing country such as Canada, I believe that for years to come we can well afford to take the standpoint of the producer. For years past the agriculturist has not received his proper share of profit. During the past five years the wheat growers of Canada have sold their product at lower prices than the producers of any other first-class wheat in the world, and that by many cents a bushel. This was not due to speculation or manipulation, but simply because each year at a given time they had dumped on the world more wheat than the market could assimilate, and the price went down so that they had to accept a sacrifice price".

There had been much talk about controlling rates and insurance, said Mr. Evans, but these were small matters compared with the control of marketing, and if this could be regulated, it would mean more in profits to the wheat growers than anything else. The same thing held true with regard to live stock and many other important products.

DUMPING A COSTLY PROCESS.

As an example, Mr. Evans said that in the fall of 1913 there was more wheat dumped on the market at Fort William than Liverpool could take within the time from all the countries of the world, with the result that prices were forced down to a point where it hardly paid the grower. He got the bottom price, but later on the men who handled it got the higher prices, simply because of bad marketing methods.

This, said Mr. Evans, was an economic matter which might well attract the attention of the statesmen of Canada, as well as of the farmers and producers themselves. He considered that it would not be an extremely difficult matter to set in motion machinery which would give a truer idea of the economic conditions which govern these matters. Such conditions were not accidental or artificial, but showed the clear relationship between cause and effect.

"Those of us who cannot go to the front", concluded Mr. Evans, "might well justify our position by giving attention to these other needs of our country, so as not only to secure greater production, but also to secure to the Dominion greater profits from that production, at a time when every possible profit that can be attained is needed".

Montreal Gazette

THE GARDEN AND ORCHARD

THE SPRAYING CAMPAIGN FOR 1915

PREPARATIONS are already being made by those who intend to spray their trees and in a few weeks time the hum of the power sprayer may be heard in the orchard. Spraying is becoming general in Quebec; the power sprayer is replacing the hand pump in the larger orchards and the fruit-growers are spraying better and more frequently than ever before. A few who only sprayed twice last year will spray three times this year. Practically all orchardists now agree that three sprayings are necessary in a bearing orchard if a high class crop of fruit is expected. Spraying may be likened to fire insurance and is intended to protect the trees during the whole time that there is danger of injury occurring to the tree, foliage or fruit.

The following are some of the more important apple tree pests and all may be found in practically every orchard:—

Insects.—Oyster Shell Bark Louse, Bud Moth, Caterpillars (Forest and Tent), Codling Moth and Green Apple Tree worm;

Fungous diseases, — apple scab and cankers of various kinds. All of these may be readily controlled by spraying but one spraying will not suffice as they do not all occur at ont time. However, it has been found that there are certain stated times at which sprayings may be given with entirely satisfactory results. The following three sprayings are usually sufficient to protect the tree foliage and fruit from all of the above named pests:—

1. *Dormant Spray.* Time, while trees are dormant. April 15th until buds begin to open. Formula,—1 gallon of commercial Lime-Sulphur Solution to 9 gallons of water, or if home made solution is used dilute to 1.03 sp. gr.

2. *Second Spray.* Time, just as first leaves are beginning to open and until blossoms are showing pink or before first blossoms open. Do not spray while trees are in bloom.

Formula:—1 gallon commercial Lime-Sulphur solution to 30 to 35 gallons water, or if home made solution is used dilute to 1.01 sp. gr., and add 2½ to 3 pounds of arsenate of lead to every 50 gals. of the spray. Arsenate of lead is most important as at this time it is intended to kill the caterpillars and bud moth worms otherwise foliage may be seriously injured.

3. *Third Spray.* Time, just after bloom is over or when last petals have fallen and before calyces (blow end) of apples have closed, which is usually about ten days after petals have fallen.

Formula:—1 gallon commercial Lime-Sulphur solution to 35 to 40 gallons of water or if home made solution is used dilute to 1.009 or 1.008 sp. gr. and add 2½ to 3 pounds of arsenate of lead to every 50 gallons of spray. The arsenate of lead is for the codlin moth and must be put on just at the right time otherwise it will be of no use.

Occasionally a fourth spray may be necessary to control a late infection of scab (for which use Lime-Sulphur solution as in third spray) or where the green apple worm becomes serious (when arsenate of lead should be used).

T. G. BUNTING

LIME SULPHUR SPRAY

For Scale Insects, Apple Scab and Other Fungous Diseases

TO have good apples you must spray, and the first spray should be on by the 1st of May. Now is the time to prepare for this work. Do not wait to see if there are going to be any insect pests or apple scab, but take it for a certainty that they will be there.

If the caterpillars eat the leaves the tree cannot make any growth or develop fruit buds. Two or three defoliations may kill the tree.

There are two mixtures or sprays which may be used for Apple Scab or other fungous diseases, viz:—Lime Sulphur and Bordeaux Mixture: The first needs to be boiled, the second does not. The former also kills Scale Insects.

If you make lime sulphur spray mixture you will need something in which to do the boiling. Where you have not steam to boil with, a fireplace may be built, outside, of brick or stone. A large box for boiling is convenient and easily made of 2 inch plank with galvanized iron bottom, allow the iron to project beyond the sides and ends for a few inches so they will not burn when placed on fire. If the box is pretty well put together it would need water in it for a few hours only to swell it and prevent leaking. Size for making 40 gallons of mixture, 6 ft x 3 ft. x 18 inches deep. It should be provided with a cover to keep in the heat, and prevent boiling over. Make a hole in the cover so that it may be stirred constantly with a stick or hoe.

Having your fire-place and boiler built, you are now ready to use the lime and sulphur. To make 40 gallons of the concentrated mixture, mix 100 lbs. of flowers of sulphur with enough water to make a thin paste. Then put 50 lbs. of fresh rock lime (not air slaked) in the boiler with 15 or 20 gallons of water. It would be better to have started the fire to warm this water as it hastens the slaking of the lime. While the slaking is going on, pour in the sulphur paste, and add water to make up 40 gallons and keep this amount constant. Having once measured out the 40 gallons it may be indicated on the side of the boiler to save save future trouble of measuring. The boiling should continue steadily for one hour, after which time it should be allowed to cool and then be tested with a Lime Sulphur hydrometer to ascertain the density or specific gravity. When this is known the amount to dilute the concentrated solution for spraying is easily worked out. For example, if the specific gravity of the concentrate is 1.24 and (as has been established) 1.03 is the specific gravity of the solution for the dormant or first spray, the number of times to dilute the concentrate is .24÷.03=8 times, that is, one gallon of concentrate to 7 gallons of water. The strength of the 2nd spray should be 1.01 sp. gr. or 1.009 sp. gr. and for the 3rd and any subsequent sprays 1.008 specific gravity.

It may be stated that usually the number of times to dilute the commercial concentrate works out in the following way:—

FOR "COMMERCIAL CONCENTRATED"

Dormant or 1st Spray.	Before buds burst, 7 gals water to 1 gal. water.
2nd Spray.	Just before Blossoms open 32-35 gal. water to 1 gal. Concen.
3rd Spray.	Immediately after the blossoms have all or nearly all fallen 35-40 gal. water to 1 gal. Concen.

These sprayings are for the scale insects, apple scab and other fungous diseases. The dormant spray also prevents to a certain extent the eggs of the tent caterpillar moth from hatching, and has a beneficial effect on the development of the foliage.

To make this mixture an insecticide for all insects, add 2½ lbs. arsenate of lead to 40 gallons of mixture. The lead arsenate also improves the spray as a fungicide.

The size and kind of spraying outfit depends on the number of trees to be sprayed. Any number above ten acres would warrant a gasoline power outfit or other large power machine.

A. C. G.

Short Course Class in Horticulture at Macdonald College, Feb. 8—12, 1915. Forty persons were registered in the Class. Prof. Bunting, and Messrs MacLennan, Gorham, and Walker, Class instructors, may be seen in the group.

BORDEAUX MIXTURE

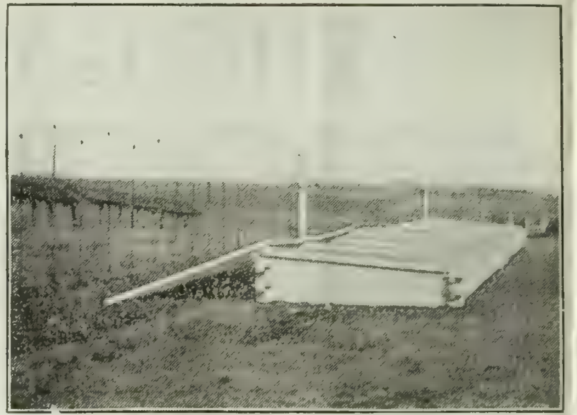
For Apple Scab, Potato Blight and Other Fungous Diseases

BORDEAUX Mixture is prepared in the following way:—

4 lbs. Copper Sulphate (or Blue Stone)
4 lbs. Lime—fresh rock lime.
40 gallons, water.

This is the strength used for spraying. With a good nozzle and 150 lbs. pressure it will take

SPRAY PLANT.—A hot liquid mixture of lime and sulphur is prepared here. Engine inside shanty and vats of solution raised above level of wagon that solution can be poured easily into tank of wagon. This operation taking place.



COLD FRAME set on the ground, sash removed for ventilation. Note bars across the frame to carry sash

from one to five gallons per tree, depending on the size of tree, man and wind.

The Blue Stone may be obtained from any wholesale drug company, and costs from six to ten cents per pound.

Only fresh rock lime should be used (not air slaked).

Dissolve four pounds of Blue Stone in 20 gallons of water—and slake four pounds of lime in a few gallons of water and make up to 20 gallons after slaking has ceased. Stir well before using. These two diluted solutions should be poured together into another barrel or directly to spray tank. Pouring should be done at same rate and at same time for each barrel. This gives Bordeaux Mixture, which is a beautiful blue colored precipitate or a flaky solid in suspension in water. If well made it does not settle down thoroughly for hours leaving clear water on top.

To test Bordeaux Mixture dip the clean blade of a Jack knife in this clear water on top and if copper is deposited on the blade you need more lime solution. This free copper will cause burning of the foliage.

If more than forty gallons is to be used a stock solution of Blue Stone and lime may be made up and kept indefinitely if kept in separate barrels. In stock solution use one pound of each material to one gallon of water so that for each gallon of the solution used there will be one pound of the blue stone or lime.

Barrels may be elevated to make mixing easier.

To kill caterpillars or any insects that eat the leaves or buds add ½ lb. of Paris Green or 2½ lbs. of Arsenate of Lead to 40 gallons of Bordeaux.

A. C. G.

HOT BEDS AND COLD FRAMES

Hot beds and cold frames are used to produce extra early crops of vegetables like tomatoes, early cabbage, early cauliflower and celery. Many of these would develop under normal conditions, but it would be very late in the season before they were ready for use. Tomato plants especially would ripen some fruit if their seed were sown in the open ground, but not enough to make the culture worth the trouble taken.

Cold frames are used for hardening off the plants grown in the hot bed. By "hardening off" is meant getting the plants used, gradually, to the cooler atmospheric temperature in the field before setting them out. If they were set directly in the field from the hot bed, they would receive such a heavy check from weather conditions in the field that they would not recover for some little time. Cold frames are also used later in the season to grow late cabbage, late celery and other crops which are set in the field from June 15th to July 1st. Most of these follow some of the earlier vegetables as a second crop thus giving us more returns from our garden.

HOT BED—The two near frames have only about 6 inches of manure under them : the rear frames have a little over a foot of manure. These were erected a month earlier than the other two. Note frames slope towards the south

HOT BED

A hot bed should be placed on the south side of a building or a high board fence to protect it from the cold north winds and to give it as much of the warm sunshine as possible. The frame is made of boards of 1½ to 2 inches in thickness. It is better if the ends are joined with hooks or mortices in order that they may easily be taken down and stored when not in use. The back, which should be placed towards the north, should be 14-18 inches high, the front 8-12 inches in order that the rain will run off easily and the plants get more sunshine. The sashes are generally 3 ft. by 6 ft. The manure in the hot bed may be above or below ground. If below ground it should be made where the land has good drainage. A trench is dug 18 inches deep, six feet wide and as long as we wish. The trench is better made in the fall. Manure for hot beds should be fresh horse manure from grain-fed animals and about one-fourth straw. It should be piled in a heap near the hot bed. When it is heated well it should be carefully turned. In about 5 or 6 days after this it should be ready for the bed. If the weather is very cold it may be necessary to throw some boiling water over it to start it heating. The bed should be made up in layers about 6 inches thick and carefully tramped to make it level and as high as the top of the trench. When one is building the surface bed the manure pile should be at least a foot wider every way than the frame. The depth of manure depends on how early we wish to make the bed. For early work (say March 1st) the depth should be from 2 to 2½ feet and at the beginning of April, 1½ feet would be sufficient. The frame is then put on and the sides banked with manure. Then put on the sash, after 3-4 days take it off and tramp the manure filling in any low place. The soil should have been prepared in the

Well grown Tomato plant.

fall and left in a heap. It should be rich and should be mixed with about ¼ its quantity of sand if it is heavy in texture. This should be spread in the bed to a depth of 4-6 inches. Put a thermometer in the bed to get its temperature. When this falls to 80° F. it is ready for seed sowing. Spade the soil and make it level, then plant the seed in rows 4 inches apart and at the same depth as you would outside. If one is using flats in which to sow the seed, he does not need to put so much soil in the frame. Water carefully and put the sash on after sowing. As the plants grow they should be aired enough to keep them from growing spindly. Water when necessary, but too much water will cause "damping-off". When big enough transplant to another bed or cold frame.

COLD FRAME

A cold frame is made like a hot bed frame, but has no manure beneath. It is used mostly to "harden off" plants, that is, accustom them to the change from hot bed to field. The soil is prepared as in the hot bed, the frame and sash being put on a few days and the bed kept closed so that the soil will warm up before the plants are put in it. As the plants grow the sash is opened more and more until 3 or 4 days before setting in the field the plants are growing under field temperature. The same attention to watering and ventilation is given to the cold frame as to the hot bed.

A. H. MACLENNAN,

Macdonald College

STRAWBERRY CULTURE

The strawberry is a very hardy plant and grows in almost every part of Canada and on a wide range of soils.

Coming as it does, the first fruit of the season, it is very welcome to our tables, and we are sorry when the season is over. There are strawberries on the market in our Northern cities in January and February, but these have not the flavor or quality of the fruit fresh from the gardens in the North in June and July.

In selecting a site choose one which is naturally well drained. Do not plant strawberries on land where water remains on the surface in either summer or winter, as they are sure to kill out.

The best soil for the strawberry is a sandy loam, well supplied with vegetable matter or a clay loam. The sandy loam will give the earlier crop while the clay loam will give the bigger.

Manure, well rotted, should be applied at the rate of 20-30 tons per acre, well worked into the soil in the spring.

Moisture is a very important factor in producing a crop, especially at blossoming time and when the fruit is setting. So a soil very retentive, although not saturated, is best.

It is best to plant after a clover crop or, next best, a hoed crop, not after sod as there is danger of white grubs being present and attacking the roots, and also the plantation is more liable to be infested with grass and weeds.

Thorough preparation is advised. Plow deeply in the fall and harrow thoroughly in the spring before planting. Clean the land of all weeds as cultivations become more difficult as the season advances on account of the runners which the plants send out. Strawberries should be cultivated often during the first season.

The number of plants required depends on how wide the rows are to be and what distance they are to be set in the row. The different systems determine this. The matted row system is generally practised. It is the easier and gives bigger crop than the Hill System, which necessitates the cutting off of all runners, taking fruit only from the original plant. If planted in rows 3½ ft. apart and set 20 inch apart in row about 7500 plants will be required for one acre.

If the plants cannot be obtained from a plantation nearby, order early from a reliable nurseryman. If you dig the plants yourself see that all large leaves and buds or blossoms are taken off before planting. Place plants in a basket with wet moss or burlap to keep them moist and fresh while planting. If the soil is very dry it is best to water the spots for the plants an hour or two before planting. Planting is carried out with greatest success in spring along in May before the soil becomes too dry. Two men working together, one having s spade and the other carrying the plants, do the planting repidly. The spade is forced into the soil about 6 inches pressed back and forth, so it leaves a "V" shaped opening, at the same time the second man places the plant. The spade is removed and soil pressed around the roots. Care should be taken to have the crown of the plant just at the surface, for if it is too deep it will be smothered and if too shallow it will dry out and die.

More than one variety should be planted because many varieties are imperfect, that is, some varieties bear only female flowers, while some are perfect, that is have the pistil and stamens in the one flower. The imperfect female flower must have pollen from some other flower, so it is better to plant the imperfect varieties alongside the perfect, so that it may be able to set fruit. Even in the perfect flowers cross-pollination gives a better setting. The following varieties are recommended for commercial purposes:—

Bederwood (Per.) Warfield (Imp.) are early;
Splendid (Per.) Sample (Imp.) are medium early; and Parsons Beauty (Per.) medium to late;
Buster (Imp.); Pokomoke (Per.) Williams (Per) and Grenville (Imp.) are also good varieties.

For domestic use:—
Excelsior (Per.) is early;
Splendid, Senator Dunlop (Per.) and Ruby (Per.) are medium Early.
Buback (Imp.), Wm. Belt (Per.) and Lovett are also good varieties.

Duration of plantation:—Generally the best results are obtained where one crop is taken. That is, at the end of the second season from planting plow them under. But most plantations are allowed to run longer—three or four seasons. Each year a new area should be set out.

In the fall after the plants have frozen they should be covered with straw, hay or, what is better still, spruce or fir boughs. This prevents the alternate freezing and thawing. In spring, after the danger from frost is past, the hay or straw is drawn off the plants between the rows so that it serves as a mulch to conserve moisture, keeps the berries clean and makes picking easier.

An acre of strawberries on good soil and well managed should yield at least 6000 boxes of berries.

A. C. GORHAM

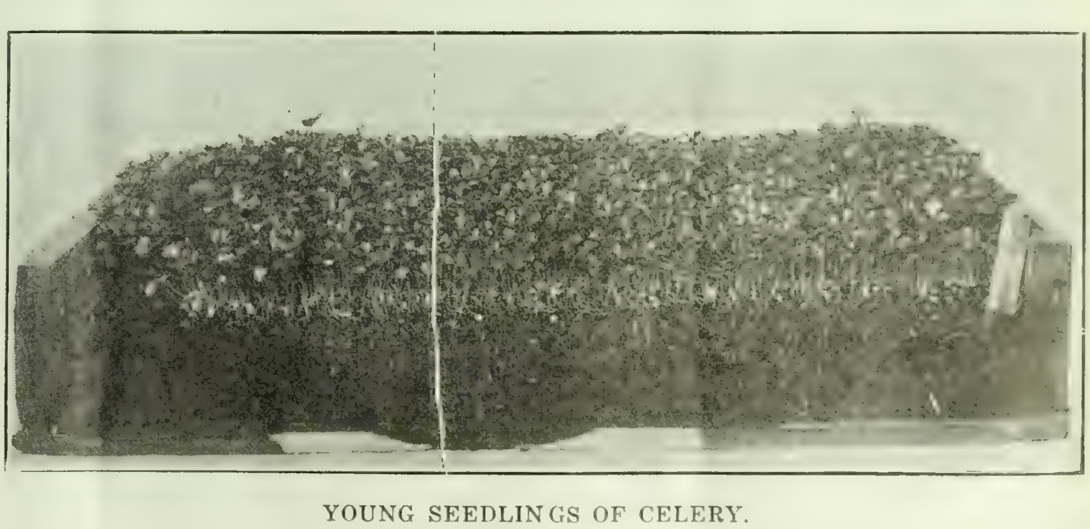
Well-thinned Onions.

PLANS FOR KITCHEN GARDENS

I. About One-Third Acre, All rows 30" apart, except 1 and 2 which are 4 ft. apart

Row
1. 100 ft. Red Raspberries, 80 ft. Red Currants, 40 Blk. Currants, 40 ft. Gooseberries, 100 ft. Strawberries.
2. 100 Plants Asparagus, 150 ft., 40 plants Rhubarb, 120 ft., 90 ft. Egyptian Perennial Onions.
3. Parsley 10 ft., Parsnips 350 ft.
4. Onions sets 100 ft. 160 ft. Carrots, 100 ft., Early Beets.
5. Onion seed 360 ft.
6. 50 ft. Leaf Lettuce, 50 ft. Head Lettuce, Spinach 160 ft., Turnip 100 ft.
7. Alaska Peas 50 ft., Gradus 200 ft., Thomas Laxton 110 ft.
8. 30 plants Early Cabbage, 20 plants Early Cauliflower, 215 ft. Late Beets, Early Potatoes.
9. Early Potatoes.
10. Early Potatoes.
11. Early Potatoes.
12. Peas, Gradus 100 ft., Stratagem 160 ft., Suttons Excelsior 100 ft.
13. Head Lettuce 60 ft., 150 ft. Wax Beans, 150 ft. Green Beans.
14. Corn 60 ft. Malakoff, 200 ft. Bantam, 100 ft. Crosby.
15. 66 Tomato plants 100 ft.
16. 40 Late Cabbage.

100 ft. Winter Squash, 40 ft. Summer squash, cucumber 60 ft., Melons 60 ft.



YOUNG SEEDLINGS OF CELERY.

THE FARM AND FARM CROPS

STANDING CROP COMPETITION

To further encourage the production of high class seed grain, the Honourable the Minister of Agriculture of the Province of Quebec hereby offers a special grant to the Agricultural Societies which have decided to hold, in 1915, competitions respecting standing crops.

The main object of this special grant is:

1° To stimulate the farmers in the growing of choice seed grain;

2° To encourage the practice of growing seed for next year's crop separate from the main crop, using only the best obtainable seed, sowing it on the best prepared land and the cleanest, allowing it to thoroughly ripen, and threshing and storing separately;

3° To obtain pure grain, i. e. free from other varieties, the presence of which can best be detected when the grain is growing;

4° To encourage the use of seed from heavy yielding strains;

5° To promote the sowing of seed from clean, vigorous crops of uniform stand and with bright stiff straw, in the case of smaller cereals;

6° To encourage careful and intelligent farming and the production of grain free from weed seeds.

REGULATIONS GOVERNING THE COMPETITION

1° *Nature of Competition.* Competition shall be limited to one crop, to be selected by the society, which should be one of the most important to the farmers of the district. Entries for competition must consist of a field not less than three acres, and where potatoes and timothy are entered, the minimum plot not less than one acre.

Selection must be made from the following crops, viz: wheat, oats, barley, corn, peas, clover, timothy and potatoes.

2° *Competitors.* Competitions shall be limited to the members of Agricultural Societies. Competitors shall be allowed to make entry in only one

Mangels and Swedes at Demonstration Meeting, East Farnham

17. 180 ft. Celery, 60 plants Late Cabbage, 30 plants Late Cauliflower.

II. 30 FEET BY 60 FEET

Row		Distance to next row.
1.	30 ft. Red Raspberries, 30 ft. Strawberries	1½ ft.
2.	Asparagus 30 plants 45 ft., Rhubarb 5 plants 15 ft.	2½ “
3.	Parsley 10 ft., Parsnips 50 ft.	1½ “
4.	Onions seed	1 “
5.	Lettuce 30 ft., Radish 30 ft. (Cucumbers and Squash 2nd crop)	1 “
6.	Spinach 60 ft.	1 “
7.	Onion sets	1 “
8.	Early Turnips 30 ft., Early Carrots 30 ft.	1 “
9.	Early Beets, followed by late cabbage	1 “
10.	Peas, Early, followed by Beans	1½ “
11.	Early Cabbage 24 plants, 36 ft., cauliflower 15 plants 24 ft.	2 “
12.	Lettuce 30 ft., Radish 30 ft., followed by celery	1 “
13.	Peas	2 “
14.	Bush Beans	2 “
15.	Early Corn followed by Early Turnips (white)	“ 2 “
16.	Late Corn	2 “
17.	Pepper 20 ft., Egg Plant 20 ft., Beans 20 ft.	2 “
18.	Tomatoes	2 “
19.	Red Currants 18 ft., Blk. Currants, 18 ft., Gooseberries 14 ft.	2 “

A. H. MacLennan

CELERY SEEDLINGS TRANSPLANTED.

PLANTING TABLE

Quantity of seeds or number of plants required for 100 ft. of row, with distance to plant, times for planting and period required for the production of the crops.

(H.B. means started in Hot Bed. In column 3, where seed is sown, plants are thinned to given distance for better quality.)

Kind of Vegetable.	Seeds (or plants) required for 100 ft. row.	Plants thinned or set in rows.	Depth of planting of seed.	Time of Planting in open ground.	Ready for use after seed Sown.
Asparag. Plants	60-80 Pts.	15 to 20 in.	4-6 in.	Early Spring	2-3 yrs.
Beans, bush	1 pint.	4 in.	½-2 in.	April, May, July.	40-65 days.
Beets	2 ounces.	2-3 in.	½-1 in.	May, June.	60-80 “
Cabbage, early.	¼ ounce	2-2½ ft.	½ in.	May seed started in h. b. March 15th.	90-130 “
Cabbage, late.	¼ ounce	2-2½ ft.	½ in.	June 15—July 1st. seed started May 15th.	90-130 “
Carrot	1 ounce.	1-2 in.	½ in.	May, June.	75-110 “
Cauliflower	¼ ounce	1½-2 ft.	½ in.	Same as Cabbage.	100-130 “
Celery	¼ ounce	6 in.	⅛ in.	May & June sd. st. h.b. Mch. and April.	120-150 “
Corn Sweet	¼ ounce	12 in.	½ in.	May-July.	60-100 “
Cucumbers	½ ounce	4 ft.	1 in.	May 25—June	60-80 “
Egg plant	⅓ ounce	1½-2 ft.	½ in.	May 25, June h.b. March 15—April 1st.	100-140 “
Lettuce	½ ounce.	4-6 in.	½ in.	April, June—Aug. 15.	60-90 “
Melon, Musk	½ ounce.	4-6 ft.	1 in.	June, May 15, in frames	120-150 “
Melon, Water	1 ounce.	Hills 6 ft.	1 in.	June.	100-120 “
Onion, seeds	1 ounce.	2 in.	½ in.	May	130-150 “
Onion, sets	1 qt. sets.	1-2 in.	1-1½ in.	May, Egyptian Perennials in September	90-120 “
Parsley	¼ ounce	2 in.	⅛ in.	May	90-120 “
Parsnip	½ ounce.	3-4 in.	½ in.	May	125-160 “
Peas	½ pint.	2 in.	2 in.	May, June, July	50-80 “
Pepper	⅛ ounce.	18 in.	½ in.	June, start in h.b. March 15.	100-140 “
Potato, Irish.	5 pounds.	12-15 in.	½ in.	May	80-140 “
Pumpkin	½ ounce.	Hills 6 ft.	1-1½ in.	June	100-140 “
Radish	1 ounce.	1 in.	½ in.	May, June, August.	20-40 “
Rhubarb	33 plants.	3 ft.	2-3 in.	Early Spring.	1-3 yrs.
Salsify	1 ounce.	2 in.	½ in.	May.	120-180 days.
Spinach	1 ounce.	2-4 in.	½ in.	May and August.	30-60 “
Squash, summer	½ ounce.	Hill 3-4 ft.	1-1½ in.	May and June	60-80 “
Squash, winter	½ ounce.	Hill 6 ft.	1-1½ in.	May and June	120-160 “
Tomato	⅛ ounce	2½-3 ft.	¼ in.	May and June h.b. March 15—April 1st.	100-140 “
Turnip	½ ounce.	2-4 in.	¼-½ in.	May, June, July	60-80 “

A. H. MACLENNAN

Results of Turnip experiments by Mr. Kilgour near Shawville, Pontiac, Co.

society and but one entry can be made by each competitor.

3° Societies desiring to enter this competition must notify the Secretary of the Council of Agriculture before the first of May, and must not make more than 25 entries.

4° The list of the competitors shall be transmitted to the Secretary of the Council of Agriculture before the first of July.

5° Societies must charge competitors an entry fee of not less than 25 cents and not more than one dollar.

PRIZES

The Department of Agriculture will grant $75. to each of the societies above mentioned; this special grant will be employed in paying prizes not less than $20, $15, $12, $10, $8, $6, $4. The grant will be equal only to the amount paid for prizes, if it is below $75. Prizes will be awarded by the judges only to fields deserving such prizes. The fee received with the entries will be equally divided amongst the sucessful competitors, besides the special grant above mentioned.

If the number of competitors is less than ten, the prizes will be as follows:—1st $10, 2nd $8, 3rd $6, 4th $4, 5th $2, 6th $1.00.

Mr.-J. M. Parker Lennoxville in his field of mangels shortly after Singling.—Note the effect of complete fertilizer

The plots will be visited by judges appointed and paid by the Department of Agriculture of Quebec, and the Secretaries of the Agricultural Societies who will organize such competition will advise the Secretary of the Council of Agriculture, at least 8 days before the contest will be held, of the dates when the judges will be required.

It is important to send the list of competitors on or before the first of July, 1915.

Yours very truly,

G. A. GIGAULT,

Deputy Minister of Agriculture

Quebec, 18 March 1915.

SEED IMPROVEMENT IN THE PROVINCE OF QUEBEC IN 1914

Report of Mr. G. A. Gigault, Deputy Minister of Agriculture to the Canadian Seed Growers' Association held March 11-12 in Ottawa

SINCE 1911, every year the Department of Agriculture invites the agricultural societies to encourage the production of high class seed grain and offers them a special grant for that purpose. The grant is paid by both the federal and provincial governments.

The annual circular sent to such associations mentions that the main object of the grant is:

(1) To stimulate the farmers in the growing of choice seed grain;

(2) To encourage the practice of growing seed for next year's crop, using only the best obtainable seed, and threshing and storing separately;

(3) To obtain pure grain, free from other varieties;

(4) To encourage the use of seed from heavy yielding strains;

(5) To encourage careful and intelligent farming and the production of grain free from weed seeds.

The number of agricultural societies which have accepted the grant of $75.00 is as follows:—

Year	*Number of societies*	*Prizes*
1911	54	$1,739.00
1912	59	4,363.00
1913	61	4,557.00
1914	64	4,892.00

The provincial government pays the travelling expenses and the fees of the judges, as well as one third of the prizes, the other two thirds being paid by the federal government.

PROVINCIAL EXHIBITION

A provincial exhibition is held also every year. The entries and expenditure were as follows:

Year	*Entries*	*Prizes*
1911	275	
1912	325	$531.00
1913	400	588.00
1914	429	669.00
1915	540	828.00

LOCAL EXHIBITIONS

Local seed exhibitions have been also held by agricultural societies with the following results:

Year	*Number of exhibitions*	*Prizes*
1911	7	$ 350.00
1912	8	542.00
1913	11	862.50
1914	23	1,678.00

Besides the general competition, there are:

(1) A special competition for farmers who have obtained a prize in the standing crops competitions for seed grain in the preceding year; (2) a competition for registered seed and specially for selected seed, open only to members of the Canadian Seed Growers' Association.

THE QUEBEC SEED GROWERS' CO-OPERATIVE ASSOCIATION

We have always believed that in order to stimulate the farmers in the growing of choice seed grain, it was necessary to form among the seed growers a strong co-operative association, which would buy first class seeds from reliable growers and chiefly from its members, and would sell them to the farmers. We have encouraged the organization of such an association and our hope has been realized.

On December 5th 1914, the Minister, the Hon. J. E. Caron, published in the Official Gazette a public notice organizing legally the "Quebec Seed Growers' Co-operatibe Association" having its chief place of business at Ste-Rosalie, in Bagot County. It has a good grain elevator at Ste-Rosalie Junction, where the C. P. R., the G. T. R. and the Intercolonial cross each other. It is consequently a good distributing point for the province and for Canada.

That society is formed in virtue of the law respecting the co-operative agricultural associations.

It has all the powers which can be conferred by that law, but its chief aim is the improvement of seed.

Its manager will be an expert in that line as well as most of its officers, we hope. We expect also the Canadian Seed Growers' Association will help the new society to attain the useful end it has in view. They will be useful one to the other, because the co-operative society, if well managed, will distribute at remunerative prices the products of the growers you are forming with the greatest care. One will be a necessary and indispensable complement to the other. The new co-operative society will, in a most practical and rapid way, accelerate the dissemination of the knowledge and instruction you impart so well to the farming community for the improvement of seed.

This year, it has already bought a large quantity of registered seed to be resold to its most energetic members. You see consequently that it is seconding your efforts and your laudable work. In order to succeed, it needs of course the help of the "mighty dollar". It has now a subscribed capital of $14,000, which the manager hopes to increase very soon to $30,000 and even to a higher figure.

In virtue of our law, each share is of $10, payable $1.00 a year. Until to-day the manager has not accepted less than ten shares from the same person. Many shareholders have paid up their shares in full. The movement is popular and most of the farmers asknowledge the usefulness of the society.

The directors wish to carry on the management on a paying basis, so as to secure the success of the association. At first, if the profits allow it, they may pay on the paid up capital an annual dividend not exceding 6%, and after they have formed a reserve fund equal to the subscribed capital, the surplus of profits may be used to pay a second dividend based, not on the capital, but on the dealings of each shareholder with the association. That system is followed by most of the co-operative associations in Europe, and here, at the Department, we greatly insist upon the formation of a reserve fund for each co-operative society and we urge the directors to try to realize profits out of each of their dealings, in order to apply them to the payment of a dividend and to the formation of a reserve fund, which is the only way to secure the credit, solvency and stability of their institutions.

The fields of the intending sellers of choice seed to the association will be visited by experts during the Summer, in order to ascertain whether the crop is pure and free from weeds. The purchases will be partly guided by the reports of the experts.

The Association has in its elevator the most modern machinery for the cleaning and selection of the seeds. It will have grinding stones in order to grind the grain unfit for seeding purposes.

The new association is a most promising one and will, if well managed, render the farmers the greatest services.

Before concluding, I may say that in 1911 the Minister bought two clover hullers, which were sent all over the Province to demonstrate to the farmers that we could raise clover seed. Hundreds of bushels of good clover seed were extracted from common hay without any special preparation. Farmers who saw those demonstrations began at once to grow clover seed, and this year, in some sections of the Province of Quebec, thousands of pounds of clover seed are offered for sale.

Many small co-operative societies have been organized by farmers and these own also clover hullers and cleaners.

ENSILAGE CORN PRODUCTION

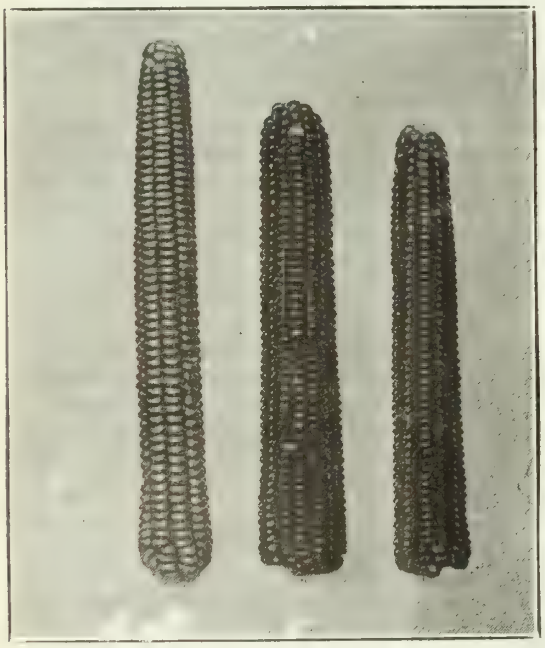
THE successful production of ensilage corn, in common with practically all other farm crops, demands primarily good soil preparation. Indifferent ateention to this feature will be attended with but indifferent success.

Corn is naturally adapted to a deep, rich, loamy soil but a variety of soils if handled in the proper way will give good returns. Large amounts of organic matter are necessary for high yields. This condition is usually met by allowing the corn crop to follow a hay crop when the sod—preferably clover—is plowed under. In addition an application of fresh barnyard manure of from fifteen to twenty tons per acre should be added during the winter, it being immediately spread where the land is not too rolling to admit of that practice. The corn plant is better able than almost any other farm crop to make use of coarse plant food such as is provided at this stage of a rotation.

PLOWING FOR CORN

The proper time to plow for corn is to some extent an open question. Fall plowing is essential on the heavier types of soils. It is practically impossible to prepare a fine seed bed on such soils if they do not have the action of the frost.

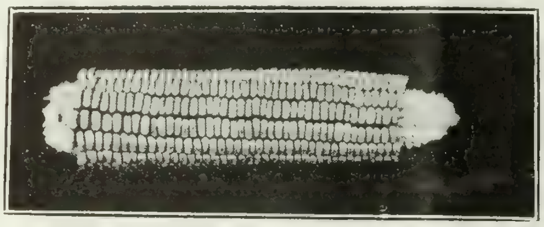
There are four main advantages to be derived from fall plowing. The soil is thoroughly pulverized by the action of the frost anl left in a free, friable condition in the spring, suitable for working down into a fine seed bed. Suitable conditions are provided for the absorption of moisture from the late fall rains and the melting snow of early spring. Large yields are highly dependent on an abundant supply of moisture. Sufficient time is allowed for the surface soil to settle and establish a connection with the subsoil beneath, from which the main supply of moisture is derived. Lastly an opportunity is afforded for the destruction of a great many weeds previous to planting the crop.



FLINT VARIETIES.—Left to right—North Dakota, Compton's Early and Longfellow

DENT VARIETIES.— Left to right—Wisconsin No. 7, Early White Cap, Early Leaming. Bailey and Golden Glow

A soil that is very badly infested with weeds, especially couch grass, is best handled by a system known as after harvest cultivation. This involves plowing a shallow furrow immediately after the hay crop has been removed and keeping the land worked with the harrows throughout the balance of the summer. Just before freezing the land is again plowed—this time deeply—so as to set it up to the action of the frost. This is an excellent system to adopt if time is available to properly carry it out; it will do a great deal towards ridding one's soil of weeds, besides storing large quantities of moisture for the succeeding crop.



An ear of Wisconsin No. 7 with the butt and tip kernels removed ready for shelling.

Spring plowing on the other hand may be advisable under certain conditions on the lighter soils. Land so situated that it is liable to wash and leach badly will be best managed in this way. Quite frequently the practice is advocated of allowing a clover sod to make some growth in the spring before plowing down, to act as a green manure. It is also claimed in this connection that the decay of clover helps materially to warm the soil. Just what effect there is from this source, if any, has never been definitely proven. It is true, however, that spring plowed land will dry out quicker and will, therefore, be warmer than will soil that is plowed in the fall and which is not given any attention in the spring previous to planting. Which system to adopt depends largely on local conditions. The continued practice of spring plowing especially if combined with drill seeding is one to be absolutely condemned as it affords no opportunity for the eradication of weeds. By such a system the land will quickly become over-run, especially in the presence of such weeds as couch grass and sow thistle.

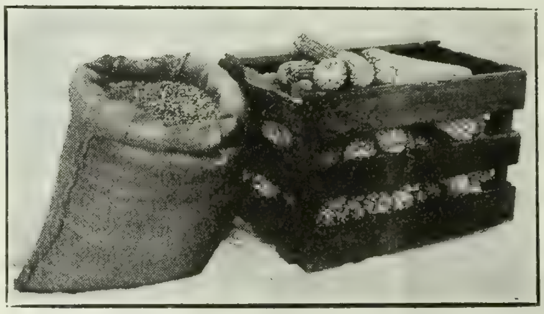
Whether spring or fall plowing is followed the soil should be kept worked in the spring to prevent loss of moisture. A great many men in the rush of spring work fail to realize that they are placing a serious handicap on their corn crop by not keeping their land surface cultivated in the early spring. Unworked land bakes into a hard, dry condition which is difficult to work down at planting time. An occasional stroke with the harrow during the warm days in early May accomplishes a very definite result in preparing a fine seed-bed—conserving moisture and warming up the soil.

There is little use in planting corn until the soil has become thoroughly warm. In a cold backward season it is much better to delay seeding than to plant under unfavorable conditions even though it may be getting late. Corn above everything else demands warmth. Few crops suffer so much from cold undrained soils and backward weather conditions.

SEED CORN

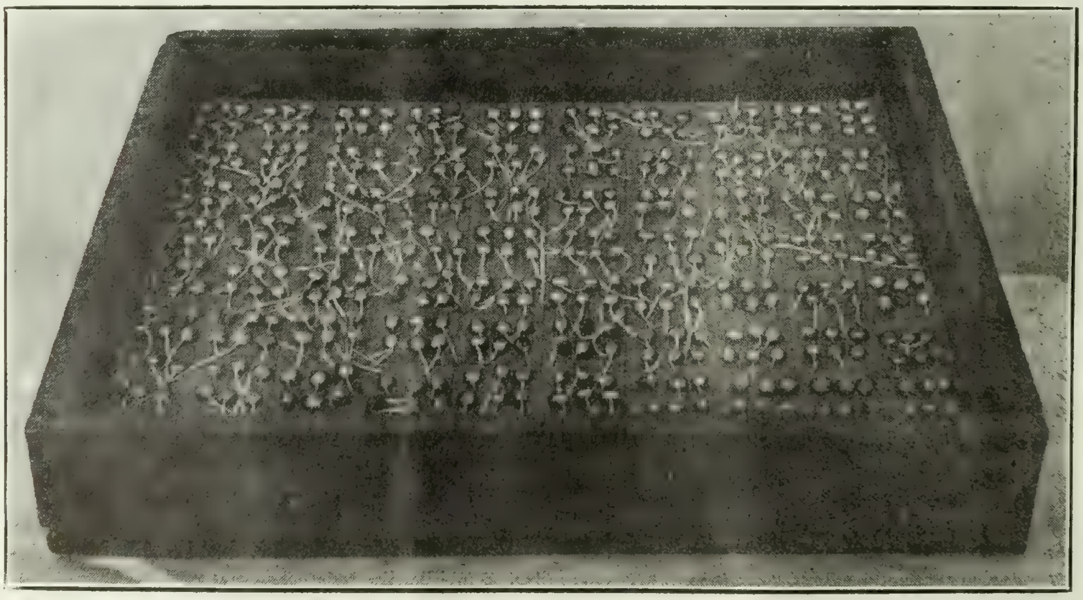
Southwestern Ontario, a district comprising about six counties, has been very appropriately called the Corn Belt of Canada. This district is recognized as the chief source of reliable ensilage seed corn for Eastern Ontario and Quebec. During the past few years corn growing in that section has received a marked stimulus, and at the present time a special effort is being put forth to more fully meet the needs of ensilage growers in the East. Men in the East are strongly advised to get in touch with the growers of that section and buy their seed corn from them direct.

To insure a high grade of seed corn it should always be purchased on the ear. Less opportunity is afforded for selling poor ears. Moreover one will always obtain a more uniform prduct and seed of a higher germinating power as corn loses its vitality very quickly when removed from the ear.



The right and the wrong way of buying ensilage seed corn

A great deal of seed corn is bought every year of a variety that is entirely too late for the district in which it is to be grown. Flint corns as a class are earlier than are the Dent varieties.



A germination box for the ear test

The best available Flint varieties for Quebec conditions are such as the "Longfellow", "North Dakota" and "Compton's Early". The Dents are best represented by varieties known as "Bailey", "White Cap", "Golden Glow", "Early Leaming" and "Wisconsin No. 7". In ordering one should always stipulate that if there is more than one strain of any variety the earlier one is desired. It is usually a good practice to seed two varieties, a flint and a dent, or in other words one that is early and one somewhat later. At time of filling the silo the two can then be mixed together. This plan will give the best quality of ensilage in the average season.

Before planting time has arrived one should have a very definite idea of the germinating ability of his seed. With ear corn a very simple and yet reliable germination test can be arranged. By numbering each ear and giving them a corresponding number in the test box an exact record of the germinating ability of the ear is obtained. Care should be shown in selecting the kernels for testing. Usually six are taken—two from near the base, two from the upper part and two from the centre. When taking out the kernels the ear should be revolved so as to get representatives from all sides of the ear. A suitable test box can be made by filling any flat box with sand or sawdust and placing over this cloth or blotting paper on which the kernels of corn may be placed. It will be necessary to keep it in a warm, moist state. Beside the kitchen stove is usually a good location. Each kernel should send a strong sprout within six days. The ears carrying kernels which fail to show strong germination should be discarded from the seed lot.

Fairly reliable results may be obtained by a simpler method if the operator knows exactly how to detect a defective ear. By shelling each ear separately and examining the kernels before placing with the bulk lot it is possible to eliminate most of the weak ears. This method should not be relied on unless one is sure of his own judgment.

Bulk corn should always be tested. Kernels are best selected indiscriminately from all parts of the sample and a sufficient number taken to insure a reliable test. The rate of planting will then be governed by the percentage germination recorded.

In shelling the first operation should be the removal of the butts and tips. Kernels from these parts of the ear are invariably irregular in shape and give but indifferent results on planting. Moreover they do not admit of uniform seeding, especially in check row planting, as a planter is adapted to sow even sized kernels.

Still further uniformity can be given to the seed by the use of a good fanning mill. With proper sieve attachment any small light kernels may be removed and the quality of the seed correspondingly improved.

L. C. RAYMOND,

Macdonald College

PRACTICAL ADVICE TO MAKERS OF MAPLE SUGAR AND SYRUP

THE pails must be of tin, well soldered inside, free from rust and other impurities, and be well washed and scalded in the spring before using.

For a sugary of less than 1000 spouts, one gallon and a half pails may be used, but two gallons ones are preferable; for 1000 spouts and over, no pails under two gallons should be used.

The spouts should be of some metal that does not rust because rust spoils the flavor of the maple sap and that of the products; it also blackens the syrup and sugar. Tinned spouts rust less. They, as well as all utensils for the sugary, without exception, must be scalded and well washed before the sugar-making season.

The evaporator and gathering and storage tanks must be scalded every day after being used.

The strainers of the tanks and evaporator should also be washed daily.

The storage tanks should contain a block of ice which keeps the sap from spoiling so long as there is any.

When the syrup is finished, it must be strained through a flannel strainer and be left in a syrup tank for at least 12 hours to allow all impurities that have passed through the strainer to settle.

The evaporator must contain only sufficient sap to cover the bottom of the pans, and, if modern evaporators are used, just enough to cover the corrugations in the large pans.

With a little water and a steady fire, the sap evaporates quickly and does not heat so long, which prevents the syrup from getting a reddish tint.

Use very dry wood for fuel. The drier the wood the better will your fire be, if well made, and the more rapid will the evaporation be. This a very important point.

When syruping begins, the fire must be so well kept up that the syrup may be taken from the evaporator at least every ten minutes.

Make a fire that will flame and not make cinders; open only one door of the furnace at a time, to avoid draughts of cold air under the pans as much as possible, as this would delay the boiling and blacken the syrup.

Cleanliness is indispensable everywhere and especially in the sugar house. Do not forget that maple sap sours more quickly than milk. You never use the same bowl two days running for keeping fresh milk without first washing it. Do likewise for the sap.

If possible, it would be well to scald the kettles every three or four days during the sugar-making season. The producing of what is called sap-sugar *(sucre de sève)* would thereby be delayed.

Do not use too small an evaporator as this will compel you to keep the sap for more than one day; the sap must be gathered every day and evaporated at once.

Put your syrup in cans containing at least a gallon, according to your customers' demands, and put labels on them with your name on as a guarantee that your maple syrup is pure.

When the syrup has lost its fine maple taste, make soft sugar in small tubs or hard sugar as long as it hardens, and if you have customers wanting sap-sugar (*sucre de sève*), make it into blocks or loaves.

Sugar sells best in one pound blocks or loaves.

Do not forget that a law has been passed in the United States prohibiting the entry of black sugar, commonly called "Beauce sugar".

Thus you will in future strive to make only first class yellow sugar.

The Pure Maple Sugar and Syrup Co-operative Agricultural Association whose head office is at Waterloo, (J. H. Lefebvre Secretary) has adopted a label and trade-mark which is supplied to its members. It bears the name of the Association and that of the maker and is a double guarantee for the purchaser. No honest sugar maker will hesitate to put his name on his products.—*From Circular No. 2, Dept. Agr., Quebec.*

NO SHORTAGE OF WHEAT IN CANADA

OTTAWA, March 9th, 1915. A press bulletin issued to-day by the Census and Statistics Office gives the results of a special inquiry for the purpose of ascertaining the stocks of wheat in Canada on February 8, 1915. The inquiry, carried out by direction of the Hon. Sir George Foster, Minister of Trade and Commerce, and conducted by the Census and Statistics Office in conjunction with the Department of Trade and Commerce and the Board of Grain Commissioners, was effected by means of schedules addressed to Elevator, Flour Mill and Railway Companies and to crop reporting correspondents for the estimation of quantities in farmer's hands. Compilation of the returns received shows that the amount of wheat, and of wheat the equivalent of flour, in Canada on February 8 last was 79,130,593 bushels, or, if allowance be made for a small proportion of non-replies, an aggregate in round figures of 80 million bushels. The total of 79,130,593 bushels is distributed as follow: Terminal elevators 2,853,679 bushels, railway elevators 1,213, 952 bushels, other elevators 26,776,246 bushels, flour mills 6,160,840 bushels, in transit by rail 12,571,876 bushels and in farmers' hands 29,554,000 bushels. The result of the inquiry shows that the quantity of wheat in Canada should be amply sufficient to meet all requirements between now and the next harvest. For seeding this spring and for food during the next six months, it is estimated that 44¼ million bushels will be required, thus leaving, on February 8, 1915, in addition to the usual small quantity of imports, a balance of 35¾ million bushels for export and reserve. From February 8 to March 2, 36,370 bushels of wheat, and flour expressed as wheat, were imported and 6,741,990 bushels were exported. The inquiry took no account of quantities of wheat flour in the hands of wholesale and retail vendors in towns and villages throughout Canada, nor of quantities of wheat in local grist mills. These quantities, although relatively small in individual cases, amount to a considerable aggregate, tending to show that the estimate of 80 million bushels is not excessive.

AGRICULTURAL VALUES IN 1914

A press bulletin issued to-day by the Census and Statistics Office summarizes the results of inquiries made by crop-reporting correspondents as to (1) the values of farm land, (2) the values of farm help and (3) the values of farm live stock in 1914.

VALUES OF FARM LAND

For the whole of Canada the average value of farm land held for agricultural purposes, whether improved or unimproved, and including the value of dwelling houses, farms, stables and other farm buildings, is returned as $38.41 per acre, which is about equal to that of the last similar inquiry in 1910, when the value was given as $38.45 per acre. In 1911 the average was returned by the Census as $30.41, but this value was based upon returns from all occupiers, including farms only recently settled and therefore of less value. By provinces the average values of 1914 range from $21 per acre in Alberta to $150 per acre in British Columbia. In this province however the high value is due to orcharding, ordinary agriculture being subsidiary to fruit culture.

WAGES OF FARM HELP

In recent years the wages of farm help have increased considerably, and they reached their highest point during the bumper harvest of 1913. But in 1914 the pendulum swayed back, less labour being required on farms owing to lighter crops. Since August the war has had for one of its effects an increase in the supply of farm labour and consequently a fall in the wages. The demand for labour this winter has also decreased because of the increased cost of board. For the Dominion the average wages per month during the summer, including board, were $35.55 for male and $18.81 for female help. For the year, including board, the average wages were $323.30 for males and $189.35 for females, whilst the average cost of board per month works out to $14.27 for males and $11.20 for females, as compared with $12.49 and $9.53 in 1910. Average wages per month in 1914 were lowest in Prince Edward Island, viz., $24.71 for males and $14.48 for females; in Nova Scotia they were

$31.20 and $14.80 and in New Brunswick $31.93 and $15. In Quebec the averages were $33.56 and $15.65, and in Ontario $32.09 and $16.67. In the western provinces they were for males $39.13 in Manitoba, $40.51 in Saskatchewan and $40.26 in Alberta, females receiving $22.35 in Manitoba, $22.-96 in Saskatchewan and $23.63 in Alberta. The highest wages were paid in British Columbia, viz., $47.85 for males and $31.18 for females, these averages being substantially less than in 1910 when males received $57.40 and females $38.

VALUES OF FARM LIVE STOCK

Values are well maintained so far as comparison with the three years ended 1910 is concerned; but during 1914 there has been a substantial reduction in the value both of horses and of swine. It is a cause of general complaint that the demand for horses other than for military purposes has fallen off, and that prices are less by from 25 to 40 or 50 p.c. than they were in 1913.

Owing to the high price of grain the keeping of swine in the west is said to be no longer a paying proposition. Hogs have been sold for what they will fetch—frequently for as little as 3½ cents per lb. —and many have been marketed in an unfinished condition. On the other hand the prices of cattle have been well maintained and the average values for dairy cows and for other horned cattle are considerably above those of 1910. The averages per head for all Canada come to $127 for horses, $87 for milch cows, $42 for other cattle, $7 for sheep and $12 for swine. The following is beleived to be a rough approximation of the total value of Canadien farm live stock in 1914: Horses $371,430,-000, cattle $297,131,000, sheep $14,551,000 and swine $42,418,000, or an aggregate of $725,530,000 for all descriptions.

CEREAL CROPS ON THE EXPERIMENTAL FARMS

CEREAL production has occupied an important position in the work of the Experimental Farms since their inception some twenty-eight years ago. By selection, the best varieties of grains for Canadian conditions have been brought to light and by breeding many important sorts have been produced. Pioneer wheat, a new early sort possessing many merits gives promise of filling an important place in northern sections. The results in 1914 with this and other sorts of wheat, as well as oats and barley at the Central Farm and sixteen Branch Farms and Stations and two Sub-stations are presented in Bulletin No. 81 of the Experimental Farm Series. This seasonable pamphlet is available at the Publications Branch, Department of Agriculture, Ottawa.

NITRO CULTURES

SEEding time is near and every farmer who expects to sow legumes, i.e. clover, vetch, alfalfa, beans or peas, should consider the advisability of inoculating his seed with the well advertised nitro cultures.

A nitro culture will supply the plants with nitrogen from the air, so that this valuable element is not drawn from the soil and the land is enriched instead of impoverished.

Several kinds of nitro cultures are sold on the market and the farmer reading over the glowing advertisements is probably at a loss which kind to select. Luckily for him all nitro cultures contain exactly the same bacteria and the only important difference is in the labels round the bottle. The Agricultural Colleges in Quebec and Ontario supply the farmers with these nitro cultures at cost price. Besides the lower price, the cultures supplied by the Colleges are thoroughly reliable.

It may be of interest to our farmers to know how such cultures are tested and kept in vigorous condition. Seed is inoculated from a stock culture and placed in very poor soil, usually mixed with sand. These pots are placed in the greenhouse and after one month the plants are pulled out and the roots examined for nodules. Such nodules are simply teeming with young vigorous nitro bacteria and new cultures are started with them.

General directions how to use the cultures are mailed with each bottle, but the farmer should remember that strong sunlight will kill the nitro bacteria in less than an hour. It is therefore advisable to sow on dull days or late in the afternoon and cover over the seed as soon as possible.

J. VANDERLECK

ROOTS

Choice of Variety and Use of commercial Fertilizers

TAKING such factors into consideration as time of feeding and purpose of feeding the farmer should principally aim to grow the kind of roots that will produce the highest yield of dry matter per acre under his conditions.

VARIETY TESTS AT MACDONALD COLLEGE

In the experiments at Macdonald College mangels have, on the average, given a higher yield of dry matter than the other kinds—swedes, turnips and carrots. Reckoning 10 lbs. of mangels, swedes and carrots, and 12½ lbs. of turnips, as containing one pound of dry matter i.e. as having the same feeding value as one pound of grain, and consequently representing one feed unit—the following amounts of feed have been obtained per acre at the college during 1909-1913.

With Mangels	6400 feed units.
" Carrots	6200 " "
" Swedes	5740 " "
" Turnips	4000 " "

From these figures one might conclude that mangels are the best producers closely followed by carrots. They are undoubtedly so, on deep soils and under conditions corresponding to those at the College, but this proportion between different kinds of roots does not by any means hold everywhere. On the average farm the swedes and the turnips generally outyield mangels and carrots. The two latter kinds require well drained, deeply worked soils "in good heart", whereas both swedes and turnips are more easily satisfied in regard to the physical conditions of the soil as long as it is not lacking in plant food. The reason is that the root system of mangels and carrots, although it penetrates to a greater depth, is not nearly as extensive as that of the swedes and the turnips which, are, on this account, better able to "rough it" than the mangels.

VARIETY TESTS IN THE PROVINCE

Several local variety tests have been conducted in different parts of the Province, and on different soils in connection with the College extension work in roots. These tests have amply borne out the correctness of the previous statement as may be seen from the following table.

Local Variety Tests with Roots in the Province of Quebec

Tons Roots per acre:

	Mangels	Carrots	Swedes	Turnips.
E. Crutchfield, Huntingdon. . (Clay loam.)	24.200	23.130	34.700	39.900
T. W. Taylor, Cookshire. . . (Gravelly clay loam.)	18.000	12.000	27.000	35.000
J. Kilgour, Shawville . . . . (Sandy, gravelly loam.)	28.000	25.000	31.000	36.000
J. M. Parker, Lennoxville. . (Sandy loam.)	28.000	30.150	37.700	38.600
James Drew, Lachute . . . . (Mild loam.)	......	27.600	31.000	37.200
Average	24.550	23.570	32.280	37.340

Judging only from the yield of tons roots per acre one would conclude that the turnips (soft white), were at the top. Such, however, is not the case. It should always be remembered that the turnips have a lower feeding value than the other kinds, and that 12½ lbs. of turnips are required for one feed unit, or one pound of grain value, whereas only 10 lbs. are required of the others. Transferring these figures for yield into feed units we therefore get the following averages from the experiments in the Province:

6450 feed units with swedes.
5970 feed units with turnips.
4910 feed units with mangels.
4710 feed units with carrots.

Although these results cannot, of course, be considered as conclusive they are nevertheless very suggestive. Swedes and turnips have given decidedly higher yields in the local tests, and under average conditions a man would be entirely justified in laying emphasis on the growing of these two kinds of roots. For different reasons it would, however, not be wise to exclude other kinds altogether even if a certain kind has proved to be superior in a certain locality. Mangels, for instance, keep fresh longer than other roots; carrots are unsurpassed as a spring tonic for horses; and turnips, if planted in May, will mature so early that they can furnish a splendid supplement to our dry pastures already in the middle of August, when succulent feed is mostly scarce.

On a farm where swedes do best generally speaking I would advise planting one half to two thirds of the root field with this kind, and dividing the rest of the field between the three other kinds. This arrangement will also tend to equalize to some extent at least, the influence of seasonal differences on the total root crop. And in view of the fact that mangels are the best keepers it will provide roots for a more extended feeding period.

"Magnum Bonum" and "Hall's Westbury" are two of the best swede varieties tested here at the College. In the carrot class we have yet to find a variety that will surpass "White Intermediate". Among the mangels "Yellow Globe" and "Yellow Eckendorfer" (syn. "Ideal") fit in well on shallower soils, while good strains of "Yellow Intermediate Mangel" and "White Sugar Mangel" out-yield all other mangels on deeper soils. In early developing fall turnips the choice stands between "White Globe" and "Grey Stone".

FERTILIZER EXPERIMENTS

It is impossible to predict which of the three fertilizing ingredients, nitrogen, phosphoric acid and potash is most needed for a certain crop on a certain soil. The same fertilizer does not suit every soil, and local fertilizer experiments are therefore necessary for ascertaining the exact manurial requirements of each separate farm. Nevertheless a number of experiments, conducted under similar conditions, may allow us to draw certain general conclusions in this respect.

With the purpose in view to determine the need of fertilizers for roots under average conditions such experiments have been conducted on different farms in the Province. In all cases but one the application of fertilizers has proved economical, and a complete fertilizer has, as a rule, given better results than nitrogen alone or nitrogen together with phosphoric acid. The plan of these experiments was made as simple as possible and entailed only the following combinations in addition to normal dressings with stable manure.

1. Unfertilized.
2. Nitrogen.
3. Nitrogen, plus phosphoric acid.
4. Nitrogen, plus phosphoric acid, plus potash.

Each application of fertilizers was triplicated on plots of 1-100 acre, and the plots were arranged in such a way that no two adjoining plots were treated in the same manner. By this arrangement the unavoidable influence of unevenness in the soil was partly eliminated. It is quite evident that average results thus obtained are much more reliable than results from single plot experiments, however large the plots.

LIVE STOCK

NEW BOOK

Productive Feeding of Farm Animals

by F. W. Woll, Professor of Animal Nutrition, University of California. Philadelphia and London. J. B. Lippincott Company, 1915. 353 pages. $1.50 net.

THIS book presents in concise clear language an outline of the principles of feeding, a description of American feeding stuffs and a discussion of productive methods of feeding of various classes of live stock. The appendix contains tables from which the value of any ration can be readily calculated approximately. The book is attractively printed and illustrated and gives copious references to other literature on the same subject. We can heartily recommend it as a reliable source of information on feeds and feeding for the practical farmer as well as for the agricultural student.

J. F. S.

COOKSHIRE SHORT COURSE IN AGRICULTURE—MARCH 1st-6th

THIS Course is rather a new departure in the annals of Short Courses, at least in the province of Quebec, and as such, if for no other reason, merits attention. A number of the young men on our farms have been unable through pressure of work and various other reasons to take a course at Macdonald College. It was thought that by organizing a week's Short Course a number of these young farmers and farmer's sons would be able to take advantage of a large amount of practical lectures and work in live stock and seed judging, which could be put on in that time. Accordingly, through the efforts of the local Demonstrator, assisted by the Demonstrator at Lennoxville, such a course was organized for the first week in March.

Among the twelve young men who availed themselves of the opportunity were representatives of a large part of the county. The class consisted of Mr. H. R. Brown, Compton; R. I. Waldron, East Clifton; A. G. Sherman and A. K. Pringle, Scotstown; K. R. Wood, Bulwer; W. C. McAllister, Birchton; Tom French, Eaton; K. D. McIntosh, J. R. French, J. H. French, E. C. Chaddock and Malcolm McLean, Cookshire. The men showed themselves good students and the lectures were enlivened by many interesting and intelligent discussions.

The plan of the Course was to devote one day to each class of livestock, the afternoons being wholly taken up with judging at the farms in the vicinity, which provided suitable classes for this work. Each morning a three-quarter hour period was devoted to a lecture on the feeding, breeding and management of the particular class of stock to which that day was devoted. The remainder of the morning periods were occupied with lectures on various topics connected with field crops and farm management, while some time was devoted to seed judging.

On Monday morning the class assembled at ten o'clock for their first lecture at the office of the Macdonald College Demonstrator. As the time was short only one lecture was given that morning. This was on "Swine; Breeding, Feeding and Management" and was given by Mr. W. G. Macdougall, Macdonald College Demonstrator at Lennoxville. The afternoon was taken up with swine judging at the stables of the Osgood Hotel and Senator Pope. The former furnished a class of aged sows suitable for producing bacon pigs. At Senator Pope's a class of Yorkshire sows was taken up, and a discussion of an aged Yorkshire boar.

Tuesday morning began with a lecture on "Soil Cultivation and Crop Rotation" by Mr. A. E. Raymond, the local Demonstrator. This was later followed by a lecture on "Grain Growing". As this was "Dairy Cattle" day, Mr. Macdougall lectured on their breeding, feeding and management. In the afternoon a class of Jersey cows was judged at Senator Pope's Later the class proceed-judged at Senator Pope's. Later the class proceeded to the farm of Mr. J. H. Taylor, who is shipping milk to Montreal and has one of the best grade dairy herds in the Eastern Townships. Here classes of grade Holstein and grade Shorthorn cows were taken up. These provided splendid material for judging and some good work was done.

Wednesday was "Beef Cattle" day and the afternoon was spent in judging work with Mr. F. R. Cromwell's famous Shorthorn herd. The morning periods were given to lectures on "Beef Cattle" by Mr. Macdougall and "Weeds and Weed Seeds" by Mr. Raymond.

On Thursday we were fortunate in having with us Mr. E. A. Lods of Cowansville and Mr. Macmillan, Sheep Expert at Macdonald College. The morning periods were devoted to lectures on "Fertilizers" and "Corn" by Mr. Lods and "Sheep" by Mr. Macmillan. Mr. Lods who was formerly with the German Potash Syndicate dwelt very ably with the fertilizer question and made clear a great many obscure points. Mr. Macmillan took up the sheep situation in his usual able manner. The afternoon classes in sheep judging were also taken by Mr. Macmillan. Suitable material was provided from the Macdonald College Cheviot flock at E. N. Chaddock's and the splendid Oxford flock lately purchased by C. & W. Lefebvre.

Friday was "Horse day". Judging of classes of wheat and oats was taken up in the morning and a lecture on "Draft Horses". In the afternoon the class drove to Birchton where the Agricultural Society's Percheron stallions are kept. These animals were thoroughly gone over and scored, as well as two younger stallions owned by Mr. Oscar Statton.

The amounts of fertilizers per acre were comparatively small and were comprised of:

50 lbs.	Nitrate of Soda.
50 "	Sulphate of Ammonia.
250 "	Superphosphate.
75 "	Muriate of Potash.

By using the two kinds of nitrogenous fertilizers all ingredients would be distributed at once, before planting, and the plants were furnished with this valuable but expensive ingredient during the whole period of growth. In this connection it might be worth remembering that liquid manure is the cheapest source of nitrogen at our disposal. Besides nitrogen it contains a considerable amount of potash, and it certainly is a great shame that such quantities of valuable fertilizing material are allowed to go to waste, as is the case on most farms to-day.

The method of calculation used in these experiments may be seen from the following table:

Fertilizing Experiment in 1914 *with Mangels, at the farm of Mr. J. M. Parker, Willowdale, Lennoxville.*

Fertilizer	Yield per acre Tons	Increase by Fertilizers Tons	*Value of Increase $	**Cost of Fertilizers $	Increase of Profit $
1. Unfertilized	15.000	.....	.....	....	.....
2. Nitrogen	17.500	2.500	6.25	3.65	2.60
3. Nitrogen plus phosphoric acid	22.760	7.760	19.40	6.65	12.75
4. Nitrogen plus phosphoric acid, plus potash	24.450	9.450	23.62	7.40	16.22

*The mangels are counted at $2.50 par ton. Their actual value is considerably higher with present prices of oats and other feeds.

**Cost for freight and distribution is included and calculated at 30 cents per 100 lbs.

Looking over the figures for this experiment we find that there has been a regular increase from nitrogen alone up to all three constituents combined. The increase has not only been sufficient to pay for the fertilizers, but it has also given a very remunerative dividend. If we compilate all experiments, and average the results, we will find that an application of complete fertilizers is a fairly safe proposition for roots.

Results of Fertilizer Experiments with Roots in the Province of Quebec

Name of owner, and character of crop and soil.	Increase in yield per acre above unfertilized plots. Nitrogen	 Nitrogen Phosph. acid	 Nitrogen Phosph. acid Potash
	Tons	Tons	Tons
Mangels.			
Macdonald College Farm (Sandy loam.)	5.545	6.780	8.945
W. Taylor, Cookshire. (Gravelly clay.)	1.065	4.285	5.150
E. Crutchfield, Huntingdon. (Clay loam.)	2.400	1.400	2.100
J. M. Parker, Lennoxville. (Sandy loam.)	2.500	7.760	9.450
Average	2.877	5.056	6.411
Swedes.			
J. Kilgour, Shawville. (Sandy, gravelly loam.)	3.000	7.100	9.550
D. Collins, East Farnharm. (Gravelly loam.)	4.200	10.100	16.000
J. Drew, Lachute. (Mild loam.)	.800	1.000	3.000
J. Cunningham, Huntingdon (Clay loam.)	3.050	3.325	5.550
Average	2.760	5.380	8.520
Turnips.			
J. Kilgour, Shawville (Sandy, gravelly loam.)	2.550	5.550	8.600

On the average the above mentioned amounts of nitrogenous fertilizers, containing 17.5 lbs. of nitrogen, have effected an increase in yield of 2.730 tons of roots per acre. Where 37.5 lbs. of phosphoric acid was added the yield increased to 5.330 tons, and 37.5 lbs. of potash caused another rise. Complete fertilizer—consisting of 50 lbs. Nitrate of Soda, 50 lbs. Sulphate of Ammonia, 250 lbs. Superphosphate and 75 lbs. of Muriate of Potash—has in nine experiments caused an average increase of 7.840 tons of roots. Nitrogen alone gave the best result in one case, but in all the others complete fertilizer proved its superiority for this crop.

In conclusion allow me, Mr. Editor, to express, through your valuable paper, my sincere appreciation of the willingness and interest shown by the gentlemen, on whose farms the experiments were conducted, and also of the ready and able assistance afforded me by the Macdonald College Demonstrators in the carrying out of this important work.

PAUL A. BOVING,

In charge of Root Crop Investigation

On Saturday morning the class was concluded by judging work with barley, timothy and clover seed and a lecture on "Poultry".

Mr. F. R. Cromwell M. P. also said a few words to the class, congratulating them on their work and encouraging them to do all in their power for the advancement of agriculture, the greatest calling in the land.

The aim throughout the Course has been to make the work as practical as possible, and we feel that the success of the course has been largely due to this fact. We have tried to bring the work to the very doors of the men taking the Course, and that we were at least partially successful in the attempt was shown by the close attention given and by the fact that the men hated to miss any of the course.

The local Demonstrator wishes to thank all those who helped in putting on the Course and those who attended for their good attention. We venture to hope that an even stronger Course may be put on next year and that a much larger number will avail themselves of it.

A. E. R.

SHEEP IN COMPTON COUNTY

On Thursday March 4th, a meeting was held in Cookshire at which Mr. Macmillan spoke on the "Co-operative Marketing of Wool." An interesting discussion followed the address. As a result it was decided to form an association, to be known as the "Compton County Sheep Breeders' and Wool Growers' Association". The following officers were elected:—President, Geo. A. Hodge; Vice-Pres., F. G. Bennett; Sec'y Treas., A. E. Raymond, B. S. A.; and Directors C. Lefebvre and K. R. Wood. These five men form the executive of the Association with power to add to their numbers, the idea being to appoint a director in each of the leading sheep sections of the county.

Compton County ranks second in the province in regard to sheep production, having over 21,000 sheep. From this it is evident that there will be great scope for the efforts of this association. The intention this year is to carry on a campaign for the co-operative marketing of wool. Demonstrations will be held in the various sections as to proper methods of shearing and tying fleeces; circulars will be distributed and wool sacks to those desiring them. The wool will be brought in to central shipping points, graded and sold there. We hope by having the wool graded to realize a better price than would be otherwise possible. The grader will be supplied by Macdonald College, which is standing by the movement, in order to help it off to a good start. We prophesy a bright future for the "Compton County Sheep Breeders' and Wool Growers' Association".

A. E. R.

GENERAL STOCK BREEDERS' ASSOCIATION OF THE PROVINCE OF QUEBEC

Twenty-first Annual General Meeting

The General Stock Breeders' Association of the Province of Quebec held its twenty-first annual general meeting in Montreal on February 9th.

This Association is the federation of the four principal Live Stock Breeders' Associations in the province of Quebec, namely the Sheep Breeders' Association, the Swine Breeders' Association, the French Candian Cattle Breeders' Association and the French Canadian Horse Breeders' Association.

In the absence of the Hon. N. Garneau, president. M. Arsene Denis acted as chairman.

In his opening address the Chairman congratulated the members on their having come in such large numbers, and observed that it had become necessary to meet in a larger room than that in which they had hitherto met. The Association would attain the age of majority next year. Founded in 1895 with some forty members, the Stock Breeders' Association now counted 806. Like all new institutions, it had met with difficulties at the outset, but the critical period had been passed many years ago and the Association is now in a position to face the future with confidence, and to render the services it had in view when it was founded.

"I am happy", said the President, "to state that the Quebec and Ottawa governments have recognised the importance of our Association as well as the services it can render, and that they co-operate in its undertakings when their cooperation is found to be necessary, as, for instance, in the case of public sales of breeding stock".

The Secretary then read his annual report from which we extract the following:—

The membership of the Association comprises 806 members divided among the affiliated associations as follows:—French Canadian Cattle Breeders' Association 184; French Canadian Horse Breeders' Association 182; Sheep Breeders' Association 254; Swine Breeders' Association 186.

The receipts in 1914 amounted to $3671.35 and the expenditures to $2134.94, leaving a balance on hand of $1536.41.

The following animals were registered in the various record-books during the past year, viz., 338 French Canadian cattle, 53 French Canadian horses, 1932 swine, and 1312 sheep.

The Association held its fifth sale of pure-bred breeding stock on the 8th October in Montreal and on the 14th October in Quebec. It sold 348 animals comprising 99 cattle (of which 65 were Ayrshires, 19 French Canadian cattle, 15 Holsteins) 145 sheep and 104 swine. For this sale the Association received aid from the Quebec Government, which assumed the deficit of about $2600.

The province of Quebec is not so backward in connection with the raising of pure-bred live stock as seems to be believed in certain quarters. It has as many breeders of pure-bred sheep as all the other provinces of Canada combined, including Ontario; it has had as many sheep registered as all the other provinces combined, not including Ontario. It has to its credit as many transfers, that is sales, as Ontario. As regards swine-breeding it comes second for the number of breeders of pure-bred swine. It is well known also that it holds the first place for breeding Ayrshires and the second for Holsteins.

The discussion upon the report lasted until the arrival of the Hon. Mr. Caron, Minister of Agriculture, who requested that the discussion be continued to completion.

In his address to the Meeting the Minister congratulated the Association on its success and on having so large a meeting. He dwelt upon the necessity for a larger production of farm products. Much is expected from the Association, which should make great efforts to improve the live stock of the country and increase its numbers. He quoted statistics showing that the value of farming properties of the province had doubled since 1901. In that respect Quebec is ahead of the other provinces, Ontario included. He assured the Association that it would receive the disinterested support of the Government.

At the afternoon session several matters of general interest to live stock breeders were discussed, among others the Dog-Law, the Stallion enrolment, the public sales of pure-bred stock, the election of directors from Quebec for the National Sheep and Swine Breeders' Associations, etc. etc.

Mr. Grisdale delivered an address dealing especially with the advisability of increasing the number of pure-bred stock.

The officers elected were:—Hon. N. Garneau, President; Messrs. James Bryson and A. Denis, Vice-Presidents; Dr. J. A. Couture, Secretary. The directors for 1915 are Messrs Jos. Deland, V. Sylvestre, Napoleon Lachapelle and L. Lavallee.

CO-OPERATIVE MARKETING OF WOOL

(Continued from March issue)

5. Proper Care in the Preparation of Wool for Market

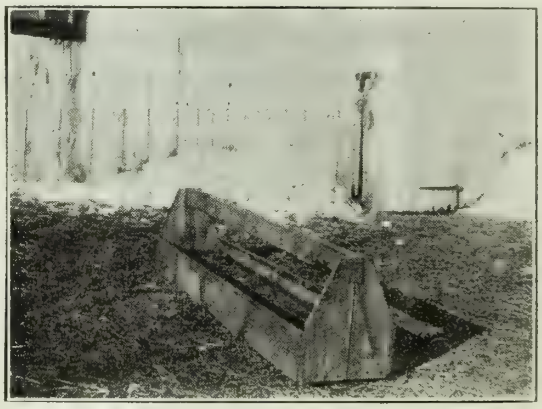
(a) *Shearing*

Shearing is the first step in the preparation of wool for market. It should take place as soon after lambing as the weather will permit. Sheep should not be shorn for several days after a rain as it is essential that wool be in its natural condition. Wool that is shorn when damp is likely to heat when stored.

A temporary platform is necessary for shearing. This may be constructed with a few boards nailed together, or a couple of doors placed side by side will serve the purpose. The platform serves to keep the fleece clean while being removed from the sheep. It should be so constructed that all droppings may be swept off after each sheep in shorn.

The sheep should be brought in and enclosed in a convenient place where they will remain clean until shorn. It is usually advisable to tag all the sheep before starting to shear. A short time spent on each sheep will remove all the taggy locks, the hands and shears may then be washed and shearing proper may proceed without delay.

The usual practice is to start shearing at the neck, placing the sheep on its haunches. From the neck work down over the shoulders, belly, sides and back, finally removing the fleece at the rump. The hand shears are rapidly giving place to the shearing machine which is quicker, easier to manipulate and less liable to inflict cuts.



A rack for feeding grain and roots.

As soon as the fleece is removed it should be turned over with the flesh side to the platform and the legs and body parts spread out to their natural size. Before the fleece is rolled up any objectionable features should be remedied if possible. Any wool to which manure is adhering should be removed. Such wool if rolled with the fleece will melt and a portion of what would otherwise be clean wool becomes dissolved. If a fleece is chaffy a few shakes when spread out on the platform will remove a considerable portion of this dirt. Straws and similar matter should be removed as far as possible.

When ready to roll, the outer sides of the fleece should be turned in on top twice or three times as the size of the fleece requires. Starting at the tail the fleece is rolled tightly towards the neck. A small portion of the neck is now pulled and twisted into a rope or band long enough to go once around the fleece and turn under the band. It is essential that the fleece be neatly and tightly rolled and well fastened, because less space is occupied in packing and it remains in better condition if handled several times before finally reaching the manufacturer. Where difficulty is experienced in tying a fleece with the wool itself, paper twine may be used. Hemp or jute cord should never be used. These are vegetable fibre, parts of which fray off and mix with the wool. These fibres are coarse, they are difficult to distinguish from the wool itself and if allowed to pass through nto the manufacturing process, they will not take the dye properly and depreciate the value of the ultimate product.

As soon as shorn the fleeces should be packed in a wool sack and placed in a dry place until brought to market. This protects the wool from dust and other dirt which would accumulate if left in the open. Wool sacks are made of closely woven burlap and are large enough to hold over two hundred pounds of wool. Wool should never be packed in feed sacks. These are manufactured from cheap material and fray easily. They are also small in size and a larger proportion of the wool comes in contact with the inside surface of the sack and the proportion of vegetable matter picked up is increased.

All wool is bought on the shrinkage basis, hence there is nothing to be gained by washing wool either before or after shearing. Manufacturers prefer wool in its natural condition because they have he necessary appliances for scouring and are able to perform this operation more satisfactorily than farmers. Creek or river washed wool shrinks about ten percent in weight while tubwashed wool will shrink about thirty percent, so that the increased price paid for washed wool is due to the fact that it is lighter in weight and the actual cash received is often less than would have been received had it been sold in the unwashed condition. Tubwashing breaks up the fleece, mixing the finer portions of the neck and shoulders with the belly. Various grades of fleeces are also mixed together so that it is impossible to properly sort or grade tub washed wool. The general tendency of this practice is to force the manufacture of a lower class of goods from wool, much of which could otherwise be used in the manufacture of high priced goods.

b) *Grading*

The present condition of the wool situation in Canada is due to the fact that no attempt has been made to meet the requirements of the buyer. Many f our largest and most important buyers have refused, in the past, to buy Canadian wool because it was not properly put up for market. Those who have bought, did so, at prices sufficiently reduced o allow for the possible error in estimate of yield rom ungraded wool as well as the possibility of oss and expense in handling grades that could not e used and required repacking. Roughly speaking woolen manufacturers may be divided into four lasses, namely woolen, worsted, felt and hosiery, each requiring wools of different grades and possessing different properties. Wool grading enables the manufacturer to obtain the grade or grades that he requires.

In order that farmers may receive the highest returns possible for their wool and that manufacturers may be supplied to best advantage, it is necessary that all wool handled by Associations be graded. Expert wool classifiers can now be obtained rom the Dominion Government free of charge. Grading can be performed in a shed or similar uilding which is obtainable for the purpose. No laborate equipment is necessary. A table of suitble size placed before a window, a pair of scales nd a small table for keeping individual block records is all that is required. Under our conditions where small flocks are kept and where each lot of wool must be graded and recorded separately, not more than from three to five thousand pounds per ay can be handled at one centre. Where more than ve thousand pounds of wool is being handled, at east two days must be allowed for delivery. The rading centre should be situated on a railroad if ossible and should be the local shipping centre for hose members in its vicinity. Delivery dates should be arranged to suit as far as possible all members of the Association.

Wool grading at local centres has many advantages for the farmer.

1. He sees the actual work performed and knows the character of the wool which he is producing.
2. He can study the differences between the grades as separated out and acquires valuable knowledge of wool quality.
3. Local grading enables the manufacturer to personally inspect the wool and buy direct from the farmer. This curtails further expense of storing, commission and freight, since the wool after sale can be shipped direct to the manufacturer.
4. The buyer comes directly in touch with the farmer. He knows the grades of wool which the farmer produces and the farmer in turn becomes acquainted with those grades required by the manufacturer. This brings about a better understanding of the requirements of the wool trade and a close relationship between producer and consumer.
5. Selling direct to the manufacturer promotes business ability among farmers.
6. Each Association receives distinctive recognition, from manufacturers for the production of certain grades of wool, consequently their reputation insures a higher average price per pound.

(c) *Sale of Wool*

When to sell will depend largely on the tendency of the market. Usually it is advisable for Associations to sell immediately after grading as farmers in most cases prefer cash at once. As far as possible sales should be made F.O.B. at the shipping centre with the understanding that packing and shipment be supervised by the buyer assisted by the Association.

How to Organize

When once the advantages of a wool-growers' association have become apparent to a number of sheep breeders in a locality they should make a general survey of the sheep industry in their vicinity, and provided a sufficient number of sheep are available for the successful organization of an association they should endeavor to stir up the interest of other sheep owners. This will take time, but where a farmer is able to see dollars in a proposition he usually begins to show interest. After the idea has been dispersed locally over the district, it is then wise to call a public meeting of sheep breeders and discuss the matter openly. If possible a speaker with a knowledge of the management, advantages and organization of such associations should be secured to address the meeting.

If after thorough discussion the meeting considers it advisable to have an association formed, the first steps may be taken and officers appointed, consisting of a President, Vice-President, Secretary-Treasurer and Directors. The Association should adopt a suitable constitution and decide on a nominal membership fee. As the association grows it will be necessary to appoint a manager to supervise the sale of wool who will be paid a salary in accordance with the work performed.

A. A. MACMILLAN,

In charge of Sheep Husbandry,
Macdonald College

FEEDING OF MOLDY SILAGE IS DANGEROUS

AVOID feeding decayed or moldy silage to live stock.

In some instances the feeding of such silage has caused the death of horses and severe cases of scouring in cattle.

In most cases the method of filling the silo has had much to do with the spoiling of the silage; hence, little can now be done to prevent the damage to the feed.

Experienced feeders of silage throughout the state are urging their neighbors to avoid feeding moldy or decayed silage to any class of live stock.

Where without the presence of mold the silage is in an abnormally heated condition the adding of water may help to check decomposition. Farmers experiencing any difficulty in the feeding of silage to their stock are invited to communicate with the officers of the Experiment station, Madison, where special consideration has been given to the feeding of silage to live stock.

RAISING CALVES

I once knew a man who claimed to be the most successful calf rearer in the state of New York. We cannot lay claim to any such distinction in the live stock business, but we have learned a few things along this line by observation and practice which might be of use to some younger or less experienced farmer.

Where calves are the main object and milk a secondary consideration, as in the case of our New York friend, who was foreman on a large stock farm, it is a comparatively easy matter to raise good calves. Warm, new milk fresh from the cow is nature's perfect food, but unhappily most of us cannot afford to feed it to calves in unlimited quantities. The next best thing is fresh warm separator milk, but this must be fed with judgement, as we shall see. The most serious difficulties in calf feeding arise where fresh milk is sold, or where the milk is sent to a creamery or cheese factory and skim-milk or whey returned to the farm. In winter, milk is often collected for several days before sending to the creamery, so when skimmed and returned to the farm it is likely to be in poor condition for calf feeding and will not improve with keeping until the next skimming day. Pasteurising would help its keeping quality, but oftentimes this is not done at the creamery and is difficult to do satisfactorily on most farms.

There are a few general principles in successful calf feeding which apply to all cases. In the first place, the calf itself should be kept in a clean, dry place, away from cold draughts. The pails which are used for feeding should be kept sweet, but this does not necessarily mean that they must be scoured out and scalded every day. We like to let the young calf run with its dam for at least the first 24 hours of its life. At any rate, it should be allowed to have the first milk, or colostrum, from the cow; for this, as everybody knows, is nature's purgative for clearing out the bowels of the young animal. All feed given to a young calf should be at blood heat; this is very important, especially in cold weather. Nothing will start a calf scouring as soon as cold or cool milk. When the calf pails are cold we rinse them out with a little warm milk before putting in the feed for the calf. Another essential principle, to avoid danger of sickness, is to start with light feeds and gradually (very gradually) increase the amount given. Here is where good judgment is required, to know when the young animal is satisfied without being over-fed. An unfailing indication is the condition of the bowels. As soon as there is a tendency to undue looseness we reduce the quantity of feed at once, and make sure that what we do give is somewhat above blood heat. If a calf gets "off his feed" we skip a meal or two altogether, then begin again with very small quantities. It is impossible to tell just how much to give, for calves vary so greatly in size and vigor. We usually start our grade Holsteins on about six pounds of new milk at a feed, soon increasing this to seven or eight pounds if the calf does not seem satisfied on the smaller allowances. Probably half of this would be enough for a small Jersey. A set of spring scales is very handy, for at a glance one can tell just how much he is feeding each time. All changes in feed should be made very gradually. When changing from new milk to separator milk, begin by replacing a pint of the

THE DAIRY

SOME SUGGESTIONS REGARDING THE CARE OF MILK AND CREAM IN THE HOME

By J. H. Frandsen, Dairy Dept., Nebraska Agricultural College

SANITARY milk is milk produced from healthy cows under conditions which prevent all outside contamination. The production of clean and healthful milk is the most important subject with which the dairyman has to deal. Considered from an economic standpoint, we find milk produced under absolutely sanitary conditions selling for practically double the ordinary price. Needless to say, for the production of sanitary milk the dairyman must have healthy cows, a sanitary barn, clean bedding, dust-free air, a clean barnyard, and clean cows. He must have clean and healthy milkers, clean milk vessels, and pure water. He must feed clean, wholesome feeds and must have a sanitary milk-room and abundant facilities for cooling the milk and cream. However, if carelessly handled in the home the milk or cream may quickly become unfit for food. The fact that such large quantities of good milk have been spoiled in the home by improper treatment after delivery prompts the writer to emphasize some of the

---

new milk with a pint of the skim-milk—gradually replacing the one with the other—but taking several days in the change before the new milk is done away with altogether. In starting to feed meal of any kind the same principle applies; begin with not more than a tea-spoonful, slowly increasing the amount as the stomach of the animal becomes used to it.

Our calves are fed on new milk for at least the first three weeks of their lives. We then begin, (very gradually as I said before), to replace the new milk with skim-milk from the creamery, or with little messes of milk which have been skimmed at the house. At the same time we introduce a little meal, (usually a mixture of wheat middlings and linseed meal, or oil cake), wetting this up with a little hot water into a thin gruel. Each day less of the new milk is fed and more of the skim-milk and gruel; until at about six weeks or two months of age the calf is taking about half gruel and half skim-milk. The amount of meal to use in the gruel must be governed by the condition of the calf. It is well after a time to teach the calf to eat dry meal—bran, shorts, middlings or oats, with a little oil cake—gradually reducing the gruel at the same time. During the summer we like to turn them out at night in a little paddock near the barn where they can have access to grass and water, keeping them up during the day, away from flies and the extreme heat of the sun. They would then be getting skim-milk night and morning with a little dry meal, and a little clean hay at noon—clover preferred. Of course it is not necessary to warm the milk for large calves in the summer. They will begin to pick a little hay when about three weeks old, and should be encouraged to do so; a small handful is enough for a start, for they will waste it if given too much.

Just a word in conclusion regarding the art of teaching a calf to drink. Remember, when he tries to put his nose up in your face instead of *down* into the pail, that he is born with a strong instinct to reach up for his dinner. This he will usually overcome in a day or two, if treated gently. Don't get mad and try to jam his nose through the bottom of the pail, nor hold his nostrils below the surface of the milk where he cannot breathe. The old-fashioned test for a good farmer was whether or not he could successfully teach a calf to drink; at any rate it is a pretty certain test for a patient or an impatient man.

C. S. MOORE

OFFICIAL RECORDS OF HOLSTEIN-FRIESIAN COWS

From February 16th to February 28th, 1915

No. and Name of Cow	AGE y.	m.	d.	Milk Lbs.	Fat Lbs.	But. Lbs. 80% Fat	OWNER
MATURE CLASS							
1. Sir Johanna's Burnside, 6283	9	0	1	698.4	22.08	27.60	
Thirty day record	9	0	1	2981.7	91.50	114.38	Gordon H. Manhard, Vaudreuil, Que.
2. Oakvale Inka Johanna, 18026	5	6	10	535.3	22.03	27.55	
Thirty day record	5	6	10	2231.2	89.30	111.63	Dr. L.deL. Harwood, Vaudreuil, Que.
3. De Vries Sylvia, 9605	6	8	12	510.9	19.57	24.46	Dr. L.deL. Harwood, Vaudreuil, Que.
4. Monie Grace 2nd, 12240	5	9	22	442.3	17.12	21.40	N. H. McConkey, Straffordville, Ont.
5. Pansey Bloomfield DeKol, 4821	11	9	10	442.1	16.23	20.30	S. J. Foster, Bloomfield, Ont.
6. Bell Mercedes DeKol Posch, 12781	5	10	17	529.0	15.11	18.90	T. H. Dent, Woodstock, Ont.
7. Ontario Maid 2nd's Star, 11654	6	2	8	531.7	15.03	18.79	N. H. McConkey, Straffordville, Ont.
8. Burkeyje, Hengerveld DeKol, 11874	5	8	28	430.9	14.64	18.31	A. D. Foster, Bloomfield, Ont.
9. Daisy Posch Johanna, 9471	7	6	0	300.2	14.11	17.64	F. Hamilton, St. Catharines, Ont.
10. Princess Hengerveld, 9827							
Thirty day record	7	1	19	2765.9	88.84	111.05	
Sixty day record	7	1	19	4810.1	186.57	233.21	Colony Farm, Essondale, B.C.
11. Pauline Colantha Tensen, 12077. Thirty day record	5	5	2	2182.3	82.59	103.24	
Sixty day record	5	5	2	4661.8	174.53	218.16	Colony Farm, Essondale, B.C.
SENIOR TWO YEAR CLASS							
1. Colantha Butter Girl, 22629	2	9	23	473.1	20.34	25.43	
Thirty day record	2	9	23	1952.4	81.25	104.07	M. H. Haley, Springford, Ont.
2. Mildred Pietertje Abbekerk, 21509	2	7	15	466.0	15.00	18.75	
Thirty day record	2	7	15	1979.7	62.52	78.16	Dr. L.deL. Harwood, Vaudreuil, Que.
3. Pussie Boutsje Wayne, 22928	2	9	13	346.9	14.10	17.63	Wm. A. Rife, Hespeler, Ont.
4. Faforit Beauty Posch, 20335	2	11	29	396.9	12.96	16.21	W. H. Cherry, Hagersville, Ont.
5. Homewood Mercena Fayne, 27660	2	9	28	380.4	12.60	15.76	M. L. Haley, Springford, Ont.
6. Daisy De Kol Netherland, 21612	2	8	22	326.2	12.53	15.67	Arbogast Bros., Sebringville, Ont.
7. Maggie Netherland Ormsby, 22337	2	7	27	393.6	12.40	15.50	Arbogast Bros., Sebringville, Ont.
8. Witzyde Evangeline DeKol, 21610	2	10	17	328.36	11.43	14.30	Arbogast Bros., Sebringville, Ont.
9. Cobequid Helbon Beauty, 22672	2	8	24	330.8	10.18	12.73	Samuel Dickie, Central Onslow, N. S.
10. Bessie Belle Banks, 19681	2	9	21	276.5	9.31	11.64	F. W. Lee, Springford, Ont.
JUNIOR TWO YEAR CLASS							
1. Het Loo Belle, 25920	2	3	7	394.1	15.73	19.67	Dr. L.deL. Harwood, Vaudreuil, Que.
2. Daisy Fayne 2nd, 25421	2	2	13	419.6	14.72	18.40	
Thirty day record	2	2	13	1730.4	60.73	75.92	M. H. Haley, Springfield, Ont.
3. Mercena Pontiac Posch, 20829	1	11	3	356.0	12.48	15.61	Daniel B. Tracy, Cobourg, Ont.
4. Homewood Colantha DeKol, 27661	1	11	28	387.9	12.39	15.49	M. L. Haley, Springford, Ont.
5. Queen Betty Wayne, 27225	2	1	3	355.9	11.14	13.93	Wm. A. Rife, Hespeler, Ont.
6. Faforit Fayne, 25415,	2	0	11	317.9	10.57	13.22	M. H. Haley, Springford, Ont.
7. Homewood Cornelia Fayne, 27670	1	11	23	286.3	9.67	12.09	M. L. Haley, Springford, Ont.

Reports of the official tests of forty-nine cows and heifers were received and accepted for entry in the Record of Merit during the last half of February. Sir Johanna's Burnside scores for Quebec in the mature class with 27.60 lbs. butter in seven days and 114.38 lbs. in thirty days. She is a new addition to the list of cows with 100 lbs. milk in one day. In the senior-four-year-old class Tidy Albino Inka leads with the excellent record of 31.92 lbs. butter in seven days and 123.38 lbs. in thirty days. Rhoda Pietje Korndyke is first among the junior-four-year-olds, with 25.63 lbs. butter in seven days. Among the senior-three-year-olds, Lyndia Lockhart Ormsby takes the first place with 19.02 lbs. butter, while Frolic Betsy Bobbet leads the juniors with 18.91 lbs. The senior two-year-olds are led by Colantha Butter Girl (daughter of the former champion cow, Queen Butter Baroness) whose record stands second in her class to the champion, Alta Posch, while her thirty day record of 104.07 lbs. gives her the Canadian championship in succession to Netherland Faforit. In the junior-two-year-old class Het Loo Belle is first with 19.67 lbs. butter in seven days.

W. A. CLEMONS, Secretary

points regarding care of milk and cream in the home.

Milk and cream readily absorb odors and collect bacteria and other impurities whenever they are exposed to the air or placed in utensils that are not scrupulously clean. If this fact is generally understood it can easily be seen why it is so objectionable to store uncovered milk in refrigerators or cellars, where it comes in contact with vegetables or other food products possessing strong odors. Milk is almost a perfect food for human beings. It is also a perfect medium for the development of certain bacteria which may gain access to it from the dust-laden air, from flies, and from unclean utensils. Some of these bacteria may be the germs of contagious diseases; others may cause digestive disorders, especially in infants and young children whose diet is largely milk.

Experiments have shown us that many germs which gain access to the milk develop very rapidly while the milk remains warm. By this we mean at a temperature above 50 degrees Fahrenheit. For instance, milk kept at 45 degrees F. may be kept perfectly sweet for twenty-four hours, while if kept at a temperature of 70 degrees F. it may sour in less than six hours. This emphasizes the importance of low temperatures in the preservation of milk and cream.

The following brief rules should enable the consumer so to care for the milk as to have an article that is at all times sweet and wholesome:

1. If possible, purchasers should insist on getting milk in a bottle or other originally sealed package. Milk dipped out of a can in the street may gather large numbers of bacteria from the dust and impurities in the air falling into it.

2. Never allow the milk to stand in a warm place for any length of time, but place as soon as possible in a refrigerator, ice box, or other cool, clean place.

3. Keep the milk or cream in the original package until needed for use.

4. Carefully wipe the mouth of the bottle before pouring milk or cream from it.

5. Do not pour back into the bottle any milk which has been exposed to the air.

6. Keep the bottle covered with a cap or an inverted tumbler as along as any milk remains in it.

7. Do not expose uncovered milk in refrigerators containing foods having a strong odor.

8. Wash milk bottles as soon as empty and do not use milk utensils for any other purpose.

9. Wash milk bottles in pure water and do not wipe with dish towel. It is better to scald them in clean water and set away unwiped to dry.

'0. Special precautions should be taken with the baby's milk bottles. They should first be rinsed in lukewarm water, then washed in hot water containing a little soda, and then scalded. In selecting a feeding bottle, choose one with a wide mouth and no corners. Never use rubber tube between the bottle and the nipple.

11. In case of contagious diseases in the house, such as typhoid, scarlet fever, or diphtheria, return no milk bottles to the milkman without the permission of the health officer.

HUNTINGDON DAIRYMEN'S ASSOCIATION

THE Annual Convention of the Huntingdon Dairymen's Association, which was held at Howick, Que., on February 26th, is recognised to be the best Convention held for some years.

The veteran president, Robert Ness, in his opening remarks referred to the progress made in dairying and agriculture since the organization of the association, thirty-three years ago. He paid a high tribute to the work of the Association's first President, the late D. M. MacPherson. Mr. Ness stated he thought the time had come when younger men should be on the Directorate of the Association and asked that the nominating committee would not consider his name in their recommendation to the Convention.

The first speaker, R. E. Husk, B. S. A. Macdonald College Demonstrator at Huntingdon, put up a strong plea for the teaching of nature study in the schools. He considered the present course of study influenced the child away from rather than to the farm. He emphasized the value of school fairs as a splendid medium to interest the boys and girls in agriculture. He believed, the action of the Protestant Board of Education in making compulsory the teaching of nature study in the elementary schools and that of agriculture in the model schools and academies an advance move that would result in influencing many farm boys and girls to remain on the farm. He said the new regulation of the Board required teachers and inspectors to attend short courses in Agriculture at Macdonald College during the summer months. The Department of Agriculture will financially assist teachers that take these short courses.

Mr. H. S. Hammond of Macdonald College, spoke on "Manure and Fertilizers". He advocated the use of some commercial fertilizers in the feeding of our crops, but it required some knowledge of soil and its constituents to enable one to select the fertilizer to use. He explained the difference between barnyard manure and commercial fertilizer. The former gave plant food and also improved the texture of the soil, while the latter only gave plant food. He considered many farmers were lax in caring for the manure. Thus there was a great waste of valuable fertilizer in the Province of Quebec. It was frequently a good policy to apply less barnyard manure and apply in addition a few hundred pounds of commercial fertilizer. The ready-made fertilizers were high in price and it was more profitable to the farmer to purchase potash in the form of muriate, phosphoric acid in the form of bone meal or acid phosphate and nitrogen in the form of nitrate of soda. Nitrogen, the third element of plant food required, was the most costly to purchase and could be supplied more economically by turning under a growth of clover or some leguminous plant. Wood ashes, basic slag or lime should be applied to all sour or acid soils. Lime rendered available the plant food already in the soil and to get best results it should be followed by barnyard manure. The above is only a very meagre outline of a most valuable and practical address.

Mr. Hammond answered many questions and there followed a very profitable discussion on this subject that is receiving so much consideration from the farmers of this district.

The afternoon session was opened by an address on "Underdraining, its value", by Mr. G. E. Emberley, also of Macdonald College, who said that according to his knowledge of the farm lands of this district, no investment would give the farmer larger returns than underdraining. The increased crops of the first two or three years usually paid for the cost of the work. With a ditching machine the cost of underdraining per acre was about $18., with hand digging of the trenches about $33 per acre. He referred to the offer made by the Quebec Government to assist by sending a surveyor, free of cost, to lay out a plan of the field, to be drained and to allow the use of a ditcher, the farmer to pay only the wages of operator and fuel. Mr. Emberley showed the value of underdraining, not only in removing the excess of water in the soil but in making the soil more porous, causing it to hold moisture better in dry times and also allowing a larger supply of air to circulate through the soil. This speaker also gave several instances that had come to his notice where a much greater return was received, because of the mechanical improvement made in the soil by lowering of the water table through underdraining. A profitable discussion also followed this helpful and interesting address.

The subject, "Market Milk, its Successful Production", was taken up by Mr. W. F. Stephen of Huntingdon. He stated that the successful milk producer was he, who in producing market milk met the conditions imposed by the city health authorities, produced a clean uniform milk and made a profit therefrom. He outlined the regulations of several cities in Canada and the United States, particularly mentioning the regulations of New York City, where milk was graded and paid for accordingly. Thus the farmer who delivered a clean wholesome milk received a price in keeping with his product. He said it cost more to produce clean milk, and the farmer should be paid extra to do it. He constrasted the conditions governing the milk supplies of Montreal and Ottawa. In the latter city the system of inspection is more perfect and a higher price is paid to the producer who delivers a high-class milk. In Montreal, under existing conditions, no protection is given to the farmer who has, at a big expense, brought his herd, stables and dairy under the City's regulations, as he realizes little more for the milk he delivers than the man whose dairy only scores 50 points. He advocated the grading of milk in Montreal, so that for milk with a low bacteria count and a content of butter fat of not less than 3.50 per cent, a higher price would be obtained than for the milk with a high bacterial count or low is butterfat. In order to make a profit from the production of market milk, the speaker said, it was essential to have cows that would produce annually not less than 8000 lbs. of milk, and as much of the protein foods as possible should be raised on the farm.

In an address on "Farm Management" Mr. Wm. Hotaling, Kinderhooh, N. Y., brought our many points seldom considered by the average farmer.

He took up his subject under the following heads:—1- Maintaining soil fertility, 2- Economical production, 3- Types of farming best adapted to our conditions. 4-Proper balance of stock to crops. 5- Balance of equipment to size of farm. 6- Sufficient working capital. 7- Amount and distribution of labor. 8- Diversity of products. 9- Proper distribution of labor. 10- Discarding of fences as far as possible. 11- Farm accounts. 12- Size of business.

Prof. H. Barton of Macdonald College brought the proceedings to a fitting close by a masterly address on "The Live Stock Industry". Stock raising, he said, was the safest and most attractive feature of farming—attractive because of the prices realized for animals and their products. He referred briefly to the rise of the industry in this and other countries. At present we were approaching a turning point, as never in our history had there been such an unbalanced relation between animal products and feeds. All feeds have soared 30 and 40 per cent over the prices of a year ago and in the great live stock centres they were rushing cattle and hogs to market unfinished rather than feed them. This would cause a greater shortage of beef cattle and consequently prices will increase. After reviewing conditions in other countries and consulting authorities he had come to the conclusion there were not enough animal products to go around. Many authorities were prediciting a period of depression after the War. This would likely cause the grain producers to suffer, but not the live stock farmer. No line of farming offered larger profits then sheep raising and he advised the farmers present to keep a small flock of sheep, to produce mutton or lamb for their own table and the home market. In this connection he said there were thousands of acres of land in Quebec province that were now unprofitable, that if sheep were placed thereon they would give a handsome return per acre and for the money invested. In live stock and dairy farming there was

POULTRY

PRESERVATION OF EGGS

APRIL is the month in which the farmer should preserve a liberal supply of eggs for the winter. Egg prices drop suddenly, roads are in a poor condition, and many of the eggs will be damaged and too old to sell when they finally arrive at the market. A farmer makes scarcely 15 cents a dozen and hardly covers expenses. It is therefore advisable to preserve these eggs for winter use and sell the fresh winter eggs for 50-60 cents a dozen.

April eggs have further a very low bacterial content and keep much better than eggs collected during the summer months. There are only two reliable methods for the preservation of eggs on the farm.

The Waterglass Method. Boil and cool down a gallon of water and dissolve in it 1 lb of pure waterglass syrup. A stone vessel is preferable to use as container, but a clean garbage can with well fitting cover will be quite satisfactory. Only clean fresh eggs are placed in the solution and special care should be taken to avoid cracked shells. The cost of the waterglass syrup is 10 cents a lb, or about 1 cent a dozen eggs as 1 gallon of waterglass solution is sufficient to submerge 10 dozen eggs.

The Lime water method. Unslaked lime is slaked and mixed with ten times its weight in water and strained through a coarse strainer to remove small stones. The mixture is stirred several times during the following two days and then allowed to clear. A white film should appear on the surface of the clear liquid, due to the action of the carbon dioxide of the air on the limewater. After the eggs are put in, this film will reform and must not be disturbed as it is a perfect protection for the liquid underneath. Any vessel, even a wooden tub will be satisfactory to hold the liquid.

During the summer months the containers should be kept in a cool place, i. e. the cellar. When the colder weather starts a temperature of about 40 F. is advisable.

There is very little to choose between the two methods, the lime water method being a little cheaper and easier. On the other hand it has been observed several times that during hot summer the water glass eggs kept better than the lime water eggs.

J. VANDERLECK.

HATCHING THE CHICKS

SO much of our success with incubation, both natural and artificial, depends on the care of the eggs between the time they are laid and placed in the machine, or under "Biddy", that we cannot afford to be at all careless. Hatching eggs should be gathered as often as possible in cold weather, the oftener the better. I have made special note for several winters that the colder the day the shorter the time the hen remains on the nest after laying her egg; this is most noticeable in trap-nest work.

Hatching eggs should be kept in a temperature of about fifty degrees if they are to be kept for any length of time. They should be placed if possible so they can be turned every few days. It is a good plan to throw a thin cloth over them. This keeps the dust off the eggs.

Do not keep hatching eggs more than a week; good results are sometimes obtained from eggs held longer than this, but it often happens that the hatch is poor and the chicks weak.

Although we have so many good makes of incubators, old "Biddy" is not to be despised by any means; she is well able to hold her own with the best incubator made. Never try to set a hen the first few days she is broody, but leave her a while until she is willing to "sit on anything". On the other hand do not leave her too long or she will become tired of sitting and inclined to stay off too long till the eggs are chilled.

Make a nest in a quiet place where the other birds cannot worry her. Fill the bottom of the box with clay, scooping it out in the centre to make a round nest to prevent the eggs rolling into corners. Then put in a layer of soft straw or chaff. Place three or four china eggs in the nest, and all is ready for the feathered incubator.

Do not forget to take Biddy off her nest every day as near the same hour as possible. Give her grain and water, and let her scratch around for a while, not too long at first or the eggs will be chilled. After a few days the length of her daily "vacation" may be left to her own good judgment, that is if she is a good sitter; some hens have to watched every day of the twenty-one days.

After the hen has been fed on the 19th day throw a cloth over the front of the coop and do not take her off again until the hatch is over. It is a good plan to offer her a handful of whole corn or a drink of water while on the nest as she may get restless if left hungry and thirsty too long. Keep her as quiet as possible, however, until the hatch is over, then remove the chicks to coop or brooder.

E. NICHOLSON.

LITTLE CHICKS

WHEN the hatch is over, whether in the incubator or with hens, the brooder or hover should be ready for the little chicks, and as soon as ever they can stand and are quite dry they should be removed from the incubator to the hover, or, if they are to be cared for by the hen, to a clean coop. I have never been able to obtain best results when raising chicks if they were left in incubator or nest box longer than twenty-four hours.

When carrying the chicks from the incubator or nest box they should be placed in a basket or box and a warm cloth laid over them. You cannot give your chicks too much care when removing them. A chill will cause bowel trouble and, if not a dead chick within a week, a very miserable one.

The brooder or hover should be heated to one hundred degrees. See that it runs nice and even for twelve hours before putting in your chicks Spread a piece of brown paper on the floor as this makes cleaning simple. When the paper is soiled replace with fresh paper and on it spread about one inch of sandy soil. If you expect to need the soil before the snow is gone lay in a stock in the fall.

The chief thing for the next twenty-four hours is to keep your chicks quiet. Darken up the windows, and except for the care of the heat, forget you have chicks till they are forty-eight hours of age. Then remove your cloth from the window and let the little fellows find out the wonders of the world. They should then be given warm water to drink and from that time see that water is always before them. I do not hesitate to say that there are hundreds of chicks lost every year through empty water dishes.

Give your chicks their first meal when they are seventy-two hours of age. This should if possible be of pinhead oatmeal or bread and milk. Grit and oyster shell should then be placed in hoppers where the chicks can have easy access to it. Do not forget a hopper for charcoal as it is the greatest factor for eliminating liver and bowel trouble. A litter of chaff can also be given to them if chaff is placed at first in the hover; the chicks will soon have full little crops before they are able to digest. Remember the first ten days of your chick's life are the most important.

L. Nicholson.,

Macdonald Colleg

---

a good return, a certainty of return, and a splendid market for the feeds raised on the farms of Quebec. In live stock farming there was permanency of system, increased fertility, consequent upon a crop rotation, and a more even distribution of labor, all of which were valuable factors which led to the ultimate success of the farmer. He said the signs of the times read to him prosperity to the wide awake live stock and dairy farmer. Never was there a time when improved live stock was in such demand, when so many breeders were adopting business principles, when men were becoming specialists in the producing of high-class live stock. It took a "big man" to make a great success of this business and because some men are not "big" enough they make failure. He advised diversity in practice, and those farmers that were making the greatest success were dairying and breeding stock,—horses, cattle, sheep and swine as well as poultry,—and in addition produced some cash crop as well. The Professor's address was most optimistic and was listened to with rapt attention, as he is quite a favourite with the farmers of this district.

A resolution was passed expressing sympathy with the widow and family of the late D. M. McPherson. Also a resolution expressing thanks to the retiring President and Board of Directors.

The nominating committee, Gilbert McMillan, Albert Ness and R. M. Howden, resommended the following as a Board of Directors, D. H. Brown, Beith; Alf. Alseph, Valleyfield; Neil Sangster, Ormstown; R. R. Ness, and Hector Gordon, Howick; D. A. McCormick, Brysonville; Geo. Tenant, St. Louis; John McDougall, Tatehurst; M. M. McNaughton, Huntingdon; Geo. Bustard, Jr. Havelock and R. T. Brownlee, Hemmingford.

At a subsequent meeting of the Directors, Robert Ness, was elected Hon. President, D. H. Brown, President, R. R. Ness Vice-President, and W. F. Stephen, Huntingdon, Secretary.

WOMAN'S WORLD

FOODS AND FOOD PREPARATION

Lesson XIII

PROTEIN OR NITROGENOUS FOODS—MEAT

BEEF is the typical animal food and one of the most important food-stuffs. It is estimated that about one-third of the money expended for food is spent for meat, (which includes all flesh) though this varies greatly in different families.

CHEMICAL COMPOSITION OF BEEF (RAW)

Beef	Water	Nitrogenous Matter	Fat	Ash
Lean	76.5	21	1.5	1
Medium . . .	73	20.5	5.5	1
Very Fat . . .	53	17	29	1

The chief points to note in this table are: —

(1) The large amount of water which meat contains. About three fourths of its total weight is made up of water, or stated otherwise 1 pound of meat contains ¾ lb. of water and ¼ lb. of nutriment.

(2) The relation between water and fat. The more there is of the latter present the less there is of the former, in other words when fat is deposited in a muscle it replaces water and not protein and so the gain in nutritive value is an absolute one and is not attained at the expense of a loss of nitrogenous constituents.

Four Points about Meat

At least four points ought to be well understood by the woman who spends the money for meat:—

1. How to select it wisely.
2. How to cook it economically and at the same time develop its flavor.
3. How to serve it attractively.
4. How to utilize the various cuts to the best advantage.

She cannot meet these requirements unless she understands the structure of meat, something of its chemical composition and nutritive value and the characteristics of good meat.

The Structure of Meat

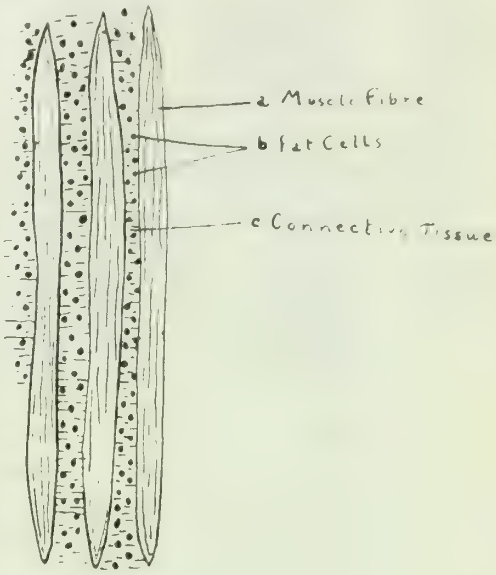
The most obvious division of a piece of meat is into bone, fat, and lean or muscular tissue. It is the structure of this last division which is of peculiar interest to the woman selecting meat. The following diagram will illustrate its composition. The muscle fibres consist of muscle tubes bound together with connective tissue and embedded in the connective tissue is the fat. A muscle tube has a wall of elastin, capable of expanding and contracting and in the tubes is the muscle or meat juice containing:—

1. Water.
2. Mineral salts in solution.
3. Proteins in solution.
4. The extractives of meat which give it its flavor.

What Makes Meat Tough

All this description may seem far from ordinary cuts of meat seen in the market and the women who is buying is inclined to say: "All those words don't help me much. I want to know how to tell tough meat. These are the terms that interest me and not muscle tubes and connective tissue." But a stress is laid upon structure at this point just because upon the condition of these invisible tubes depends the explanation for those familiar terms, tough and tender, which describe the texture. Age and exercise strengthen both the walls of the tubes and the connective tissue. So if the piece of meat is taken from a part of the body of a mature animal that is much exercised, as the leg of a fowl, one would expect that to be less tender than the breast, because the legs have so much work to do. With this principle in mind one can understand why the meat lying along the back bone and known as the tenderloin is so named. One understand, too, why meat of the younger animal, as veal, will be softer and with less of the extractives and juices which give characteristic flavor to different meats. Hence the statement, "Calf-meat is half-meat."

The question of the condition of the tubes according to the age of animals and position in the body gives the reason for learning the location of the different cuts. The location of the cut and age of the animal influence the character of the connective tissue, and of the bundles of fibres, and so determine the texture of the meat.



How to Judge a Side of Beef

Buy from the side or quarter always and learn to judge meat in this way, considering the following points:—

1. Patronize a neat, sanitary shop.
2. Consider the shape of the side.
    a. Too large a carcass shows age and coarseness.
    b. Heavy brisket shows coarseness and toughness.
    c. Heavy front quarter shows poor breed and hence poor quality.
    d. Carcass should be symmetrical.
3. *Finish of Carcass*
    a. Outside should be well covered with fat. Hard fat in lumps indicates staleness.
    h. Ribs should be well covered with fat —not too much kidney fat.

4. *Depth through the back.* Choose from a side showing thickness through the back. This indicates a generous amount of beef.

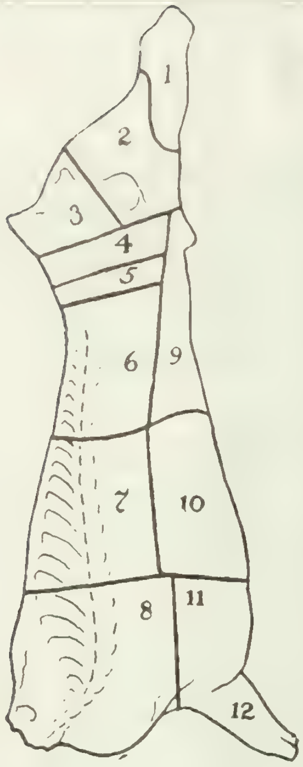
5. *Color of meat.* See that the lean is well streaked with veins of fat and that flesh is a bright red, not dark red.

Avoid a side which is sparsely covered with deep, yellow fat, with dark red flesh. This indicates cow beef.

The halves of beef are divided into hind and fore quarters by cutting between the ribs. Usually one rib is left in the hind quarter and the other twelve are on the fore quarter. The loin is separated from the round at the hip joint. The flank is cut from about the middle of the thirteenth rib to the opposite lower corner of the loin. The shank is sawed off just below the second knuckle (shoulder joint). The plate is cut off on a line extending from the middle of the twelfth rib through the point at which the shank is removed. The rib and chuck are separated between the fifth and sixth ribs. It would appear from this that there are seven main divisions of the carcass with which it is well for the buyer of beef to be familiar. Let us consider these points as regards their character and use in the order of the numbers used in the diagram.

Round.—This includes the portion numbered 1, 2, 3 of which 2 constitutes the round proper, 3 the

The Lecturers who took part in the Series of Short Courses in Home Economics given at various centres in the Province during January and February by the Staff of the School of Household Science, Macdonald College. From left to right are:—Miss Philp, Miss Hill, Miss Fisher, Miss Campbell, Miss Zollman, and Mrs Rutter.



1. Hind Shank	7. Rib	10. Plate
2, 3. Round	8. Chuck	11. Brisket
4, 5, 6. Loin	9. Flank	12. Shank

rump and 1 the shank, or leg. It is evident from what has been said before that this will not be the most tender meat, neither is it the most expensive, but it is a part very generally used. The round proper commends itself to the buyer because there is little of waste in the way of bone, and if the cook remembers that its lack of tenderness makes necessary a longer time in its preparation excellent results as regards the finished product can be obtained.

The rump makes excellent pot-roast. It is also used for stews, braising and corned beef.

Loin (4, 5, 6)—This is the highest priced cut of the carcass and at the same time yields the tenderest meat. From this are obtained T-bone or Porterhouse steaks as well as sirloin and terderloin. The tenderloin is sold under the terms fillet of beef or tenderloin of beef. All of the loin is adapted to quick methods of preparation.

Ribs (7)—This, too, constitutes a very important of the carcass, particularly the seven ribs between the loin and the chuck which constitutes the part known as the "prime ribs." This is where one finds the best roasts. "Standing rib" roasts are those in which the bone is left in. If the ends of the ribs are cut off the cut is known as a short rib. If the bone is removed and the meat rolled the product is known as a "rolled rib roast."

Chuck (8)—This portion contains the remaining five ribs. It is similar in general character to the prime ribs but not as tender and with a larger proportion of bone and gristle. The lower side of the chuck is used for pot roasts, for steaks and for boiling, while the neck portion is used for stews and soup meat. It is from the "chuck" that the shoulder cold is obtained.

1st Cut Prime Rib Roast. 2nd Cut. Prime Rib Roast.

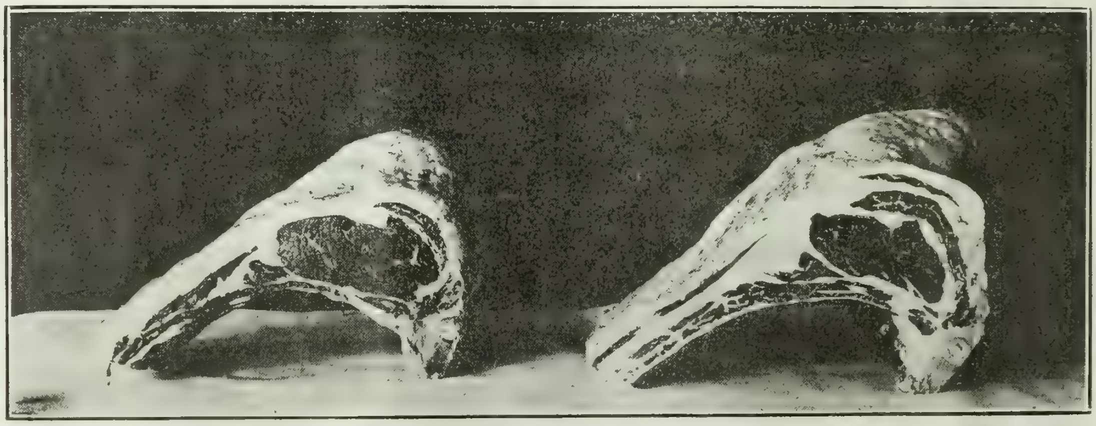
Flank (9)—This cut comes from below the loin. It is boneless and rather coarse. Its value depends upon its thickness and the quality of the lean and fat. It is nice rolled and braised and is largely used for canning.

Plate (10, 11)—This cut is taken from below the ribs and is used for corning and boiling.

Shank (12)—This cut may mean either fore or hind leg though the latter is more often included in the round and the fore shank is designated as shin, as is to be expected the meat is tough. Its chief use is for soup and mince meat.

Care of Meat

1. Remove meat from paper as soon as it comes from the market.
2. Keep it in a cool place.
3. Always wipe the meat thoroughly before cooking with a neat cloth wrung out of cold water. Use this cloth for no other purpose and have it hemmed.



Porterhouse Steak. Delmonico Steak.

General Rules for Cooking Meat

1. *Tender Cuts.*

1. Baking or roasting. Wipe the meat and trim if necessary. Dredge with flour. Lay a few pieces of fat over and around the meat and put it in a very hot oven for five minutes. Reduce the heat to moderate and finish cooking. Allow fifteen minutes to the pound and fifteen minutes extra for the heat to penetrate if roast is more than four lbs. Baste frequently with the melted fat in the pan. Pork and veal take longer to cook—about twenty-five minutes to the pound.

Brown Gravy for Roast. Pour off very carefully all the fat in the pan but two large tablespoons for every cup of gravy leaving all the brown residue. For every two tablespoons of fat add two tablespoons of flour and mix until smooth. Stir in boiling water gradually until of proper consistency and stir until it boils. Boil one minute. Season with salt and pepper and strain into a hot gravy dish. Color with a little Black Jack.

Black Jack (for coloring gravies, sauces, aspic jelly). Put one cup sugar in dry saucepan. Stir with a wooden spoon until all melted and a dark brown. Continue stirring until a heavy smoke rises from caramel. Let it smoke for a few minutes then stir in half its measure of boiling water. Stir until smooth, cool and put in a jar for future use.

Baking on a Plank

Select sirloin or porterhouse steak about 1½ inches thick. Pan-broil steak five minutes. Lay steak on plank and arrange around it a border of mashed potatoes. Bake until potatoes are brown. Spread steak with Maître d'Hotel Butter. Other vegetables may be used inside the border of potatoes, sliced tomatoes sauted in butter, buttered carrots, or small onions.

2. *Broiled Steak.* Select sirloin or porterhouse steak at least one inch thick. Grease broiler and put in trimmed and wiped steak. Hold very near the fire at first turning every ten seconds for one minute. Hold farther away from the fire and turn less frequently for from 8 to 12 minutes. Just before taking from fire sprinkle each side with salt and pepper. Spread butter over meat just after it is placed on hot platter. Halves of chickens, squabs, fish may be broiled as well as beefsteak.

3. *Pan-broiling.* Have ready a smooth, sizzling hot frying pan. Turn into it the wiped, trimmed, tender steak. Turn it at once, then every ten seconds for one minute. Moderate the heat and turn less frequently until cooked (about ten minutes). Before taking from pan season with salt and pepper. Place on hot platter, spread quickly with butter.

Note. Broiled and pan-broiled steak may be garnished with parsley and are nice served with any of the brown sauces, orange, tomato, mushroom, etc.

Top and Bottom Round. Round Bone Sirloin Steak

Sauteing. Have ready a smooth frying pan with a little sizzling hot fat. Lay tender steak in flat, turn at once. When both sides are well seared turn less frequently and reduce the heat. When cooked remove to hot platter and garnish. Thinly sliced onions may then be cooked in the fat and served around the steak. Chops and cutlets may be egged and crumbed as croquettes before sautéing.

E. B. RUTTER,

Macdonald College

THE CHILDREN'S HOMER. II

The Adventures of Odysseus. III

WHILE Telemachos thus sought his father, while the plotting suitors watched for his return, while Penelope waited in anxiety, the gods held council a second time, and Athena begged Zeus to release Odysseus from Calypso's spell.

She reminded him how just and kind, how always mindful of his duty to the gods, Odysseus had been, and how much he had suffered, and she persuaded Zeus to send Hermes to Calypso, and bid her set Odysseus free.

Hermes, then, at Zeus's command, tied on his golden, winged sandals, sped down through the air and across the sea, as lightly as a gull, that skims the waves, and dips, and skims again, until he reached the far-off island where Calypso dwelt.

Calypso was weaving at her loom, and singing; Hermes heard her as he came through the flowering meadows and the tall trees of a lovely grove to her spacious cavern. When she saw Hermes, she rose and welcomed him, and brought him meat, such as the gods eat, and crimson nectar, such as they drink. But when he told her the bidding of Zeus, that she should release Odysseus, she was sad and angry, for she loved him. Yet because she knew the power of Zeus, she dared not refuse, but promised to obey.

When Hermes had flown away, Calypso went to seek Odysseus, where he sat by the sea shore, mourning for his home and freedom. She told him he was free to go, and she would help him on his way. Odysseus, much surprised at the sudden change, feared that she plotted to kill him, because he had been her captive so unwillingly. But next day, when she gave him a great axe and other tools, and bade him build his boat, he believed her, and went eagerly to work. He felled trees and cut and shaped them into a rough-made boat. Calypso brought him linen for his sail, and at last, when all was ready, stored his ship with food and water, gave him a fair wind and sadly watched him sail off, happy in his freedom and eager to reach his home.

All went well for seventeen days. Odysseus steered his course by the stars, as Calypso had warned him, until he saw the shores of Phaeacia, the first land he had hoped to reach. But, just then, Poseidon, the sea-god, returning from a feast with the Ethiopians, caught sight of him in his boat. Filled with anger—for he hated Odysseus—Poseidon summoned all the winds and set them loose upon the sea.

A great wave caught Odysseus and threw him overboard, over-turning his ship, breaking his mast, and strewing all his goods upon the water. His clothing so hindered him that he could hardly swim, but he managed to catch hold of his boat and cling to it.

The fierce winds tossed about the wreck to which he clung as if it had been a ball and they were making sport with it, but still Odysseus held on. At last a sea-nymph saw and pitied him. She went to him and bade him leave his boat, and swim ashore, for it was not far. She gave him an amulet on a ribbon, and told him to keep it about his neck until he reached the shore, saying that while he wore it, he could not be drowned, and that when he had landed, he must throw it back into the sea to her.

Poseidon, sure that Odysseus could not possibly survive such a storm, went off to his deep-sea caves. As soon as she dared after he was gone, Athena came and stilled all the winds but one, which blew Odysseus toward the shore. And at last, the winds grew calm, and all the air was still. Odysseus, almost exhausted after nine days' battling with the storm, made his way along a rocky coast until he came to the opening of a river which ran down to the sea. There, with a final effort, he staggered ashore, and fell down on the earth, weary almost to death.

As soon as he could get his breath again, he threw into the sea the amulet which the sea-nymph had given him, watching it sink through the water until a white hand caught it. Then he turned and climbed up the bank to a wood where he found two trees growing close, forming a shelter for him. He made himself a bed of leaves, and there, where the loud-voiced winds could never beat their way, in the deep silence and peace of the forest, well-covered with warm dry leaves, he slept a long, long time.

MARGARET GRAY

"COME LET US LIVE WITH OUR CHILDREN"

By a Kindergartner

WHAT is a kindergarten and why is it so called? About a hundred years ago Froebel planned what he called a child-garden, for he enjoyed most of all the happy hours spent with his little class out of doors. Although many changes have been made since that time, the name Kindergarten with its beautiful significance has stayey with us. A child-garden where the flower of childhood may be cared for and nourished, where it may be protected from harm and surrounded by all that may be needful for a perfect growth.

Froebel says: "Stand far away from the tender flower of childhood and brush not off the flower dust with thy rough hand". Thus we see that he intended that the training should be in perfect accord with nature.

Although during his lifetime Froebel was regarded as an eccentric enthusiast and faddist, yet the appreciation of the kindergarten has spread until at the present time kindergartens are established in almost every country in the world. Froebel took as his guide the children themselves. He said "Come let us live with our children", and watched them at their play. He became the friend and confidant of his little comrades. He watched the mothers with their children and, turning from the harsher treatment in the schools of that time, he became a heralder of brighter days and sounded a note of freedom for the development of the individual.

Perhaps the most salient characteristic of Froebel's philosophy was the emphasis he placed upon the fact that only through *self-activity* do we develop; Especially is this true of little children. What a world of knowledge is gained in the first few years of life, through the ever urging impulse to do and to know. A knowledge of the relation of objects to one another, of cause and effect, of light and darkness, of heat and cold, of his own relations to his surroundings is gained in these years. A child's life is full of experimentation and discovery. He sees and delights in the light of the candle, he tries to grasp the flame. He discovers that all that glitters he may not hold. The result of his action is impressed upon him. "The burnt child dreads the fire". So in his relation to his mother he discovers that when he does certain things she smiles and, taking her as his guide, he grows in knowledge of good and evil, or as he grows older, the kindergartner takes the mother's place, directs and encourages the child in his play, guides him in his acquisition of knowledge and by her example leads him to a higher standard in thought and action.

"The Bird's Nest".—A Kindergarten Scene.

Another of the most prominent features of Froebel's system was his theory of the value of *play*. Play is the "natural instinct of the child left to himself". He saw in play a means to education. Through play the child is able to enter into the spirit of the life about him. He sees himself in his relation to others. He learns to control himself, while his physical powers develop. He learns to deny himself for the sake of others and to respect their rights. Through his education in the playground of the school, where he learns to "play fair", he is prepared for the larger field of life itself.

Since the days of Froebel many educators have added their impressions to the work, but few have turned away completely from the fundamental views laid down in his philosophy. The work has been running on in a fairly even course for many years, and there is no doubt that it has revolutionized the work of the primary school. In the olden days play in school was unheard of. Any child found playing was severely punished. Twenty years ago, when kindergartens were first introduced into the public schools of Montreal, many parents were aghast at the idea of sending children to school to spend their time in singing and playing and building with blocks. Since that time, however, opinions have gradually changed and the kindergarten, we may safely say, has come to stay and the philosophy of Froebel will remain with us always a fruitful source of inspiration.

What then of the Montessori Method? For another educator has now appeared who by her wonderful personality, intense zeal and astonishing results compels us to pause in our even course and question if we cannot accept her ideas on the education of little children. That Madame Montessori has aroused a very keen interest in the subject of education cannot be denied. That the result of her experiment has exceeded even her own expectations there is no doubt. The result of her method in the work of the school and of kindergartens will be interesting to note. Many of the kindergartners of the United States have already accepted Madame Montessori as their guide. How her method will affect our own schools is yet to be decided.

When we compare the Kindergarten with the Montessori system "certain similarities in principle are soon apparent. Dr. Montessori's views of childhood are in some respects identical with those of Froebel although in general decidedly more radical".

"Both agree that education is to guide activity, not repress it. Both defend the child's right to be active to explore his environment and develop his own inner resources, through every form of investigation and creative effort". "Environment cannot create human power, but only give it scope and material, direct it or, at most, but call it forth and the teacher's task is first to nourish and assist, to watch, encourage and guide, induce rather than interfere, prescribe or restrict".

To most Canadian teachers and to all Kindergartners this principle has long been familiar. The Montessori system gives us but a new standpoint, presented to us after keen thought and study by a woman, whose mother instinct and sympathy led her first to the study of the physical nature of the child and through these studies to experiment in the training of deficient children. The excellent results obtained in this work led her to the training of normal children, for if deficient children could so benefit by this system, how much more might be done with the normal?

In the practical interpretation of the principles of Froebel and of Montessori there is, however, decided divergence. The Montessori directress does not teach children in groups, with the practical requirement that each member of the group shall join in the exercise.

The Montessori pupil does about as he pleases so long as he does not do any harm. "The Montessori spirit is revealed in her attitude of allowing the pupil as complete freedom as possible and of holding that the chief function of the teacher should be to study the activities of the child." "The transformation of the school", she says, "must be contemporaneous with the preparation of the teacher. For if we make of the teacher an observer, familiar with experimental methods, then we must make it possible for her to observe and experiment in the school".

"The fundamental attitude of scientific pedagogy must be, indeed, the liberty of the pupil".

In practice Montessori carries out this fundamental belief more fully than most Froebelians, who also profess it.

In the Montessori schools the teacher becomes a negligible quantity, her chief occupation being to observe and study each individual child, keeping her own personality in the background that she may not exercise undue influence upon her pupils and so crush the inclinations of the individual.

(To be continued.)

F. K.

THE STEEL COMPANY OF CANADA, LIMITED

Invincible
FENCING & GATES

The Lock that holds like a Bulldog

MONTREAL

May 1st. 1915.

TO FENCE USERS

WHO MAKES THE BEST FENCE ?

Dear Sir:-

We want you to send for your copy of our catalogue descriptive of "Invincible" Fencing and Gates. Please read it over carefully, for it contains valuable information regarding fencing and the fence situation in Canada today.

Do not buy any fence until you have read this catalogue. Learn how "Invincible" Fencing is made, and compare the high grade of Steel used in the manufacture of this fence with other makes.

You need not have any misgivings when you purchase "Invincible" Fencing, for it means a fence on your farm that will last you many, many years. The dilapidated condition of numerous fences all over the country, which have been erected a few years only, now eaten by rust, stays broken, with slack and broken wires, &c. tell the story of Bessemer Steel wire with skimped galvanizing. "Invincible" Fencing is made from high grade "Open Hearth" Steel and is covered with a heavy coating of pure zinc. The life of a fence depends on the quality and coating of zinc as well as upon the quality of the Steel (See page 8 in Catalogue).

Consider in your purchase of fencing this year that "Invincible" Fencing

(1) Has a heavy protective coating of zinc and will outlast common fencing

(2) The "Invincible" lock holds tight and fast.

(3) The material is "Made in Canada" from the ore to the finished fencing.

(4) Every operation is carefully watched, - thorough tests being constantly made, and the finished product is the best fencing that modern machinery, experienced workmen and careful inspection can produce.

(5) YOU ARE NOT ASKED TO PAY FOR IT UNTIL YOU HAVE SEEN WHAT YOU ARE GETTING. You can examine, test and stretch the fence. Then you will feel satisfied to pay for it.

Buying "Invincible" Fencing means that you can secure a superior quality at a cost that will give you the best value you can obtain for your money.

Our special square cornered gate combines new ideas, as you will see from Page 35 in Catalogue, which make it superior to any other gate on the market.

We would like to have an opportunity of furnishing you with any fencing you may require.

Hoping to hear from you, we are,

Yours very truly,
THE STEEL COMPANY OF CANADA, LIMITED.
A.J.Paxton
MANAGER, FENCE DEP'T.

AYP/7

WISCONSIN INCUBATOR AND BROODER BOTH FOR $13.90

130 Egg INCUBATOR
130 Chick Brooder
BOTH FOR
$13.90 Freight and Duty PAID

If ordered together we send both machines for only $13.90 and we pay all freight and duty charges to any R. R. station in Canada. We have branch warehouses in Winnipeg, Man. and Toronto, Ont. Orders shipped from nearest warehouse to your R. R. station. Hot water, double walls, dead air space between, double glass doors, copper tanks and boilers, self-regulating. Nursery under egg tray. Especially adapted to Canadian climate. Incubator and Brooder shipped complete with thermometers, lamps, egg testers—ready to use when you get them. Ten year guarantee—30 days trial. Incubators finished in natural colors showing the high grade California Redwood lumber used—not painted to cover inferior material. If you will compare our machines with others, we feel sure of your order. Don't buy until you do this—you'll save money—it pays to investigate before you buy. Remember our price of $13.90 is for both Incubator and Brooder and covers freight and duty charges. Send for FREE catalog today, or send in your order and save time.

FREIGHT and DUTY PAID

Natural Finish California Redwood

(12c)

Write Us Today--Don't Delay

WISCONSIN INCUBATOR CO. Box 188, RACINE, WISCONSIN, U. S. A.

Is your Farm for Sale ?

Send description in full
stating price and terms
of payment. Address :

FARM EXCHANGE

P. O. B. 240. MONTREAL

The JOURNAL of AGRICULTURE

AND HORTICULTURE

Volume 18 **May 1st 1915** *Number 11*

MAY IS THE MONTH OF APPLE BLOSSOMS.

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

COOK IN A COOL KITCHEN

DON'T swelter over a hot range this summer. The NEW PERFECTION Oil Cookstove keeps your kitchen cool and clean and does away with all the ash-pan, coal-hod drudgery of the coal range.

THE NEW PERFECTION lights like gas, regulates like gas, and cooks like gas. It is gas stove comfort with kerosene oil.

NEW PERFECTIONS are sold in 1, 2, 3 and 4 burner sizes by dealers everywhere. If your dealer cannot supply you, write us direct.

ROYALITE OIL GIVES BEST RESULTS

NEW PERFECTION OIL COOK STOVES

"NOW SERVING 2,600,000 HOMES"

THE IMPERIAL OIL COMPANY
Limited

BRANCHES IN ALL CITIES

The Imperial Oil Company Limited — Heat Light Power Lubrication

Made in Canada

"Do you wear Penmans too?"

102

"Why, yes! It's the only underwear I buy, since I found it made my clothes fit better.

"That isn't all, either. This underwear is knit in some special way so it keeps its shape. It's smooth and comfortable, too, and, My! how it stands washing. You couldn't hire me to wear any other."

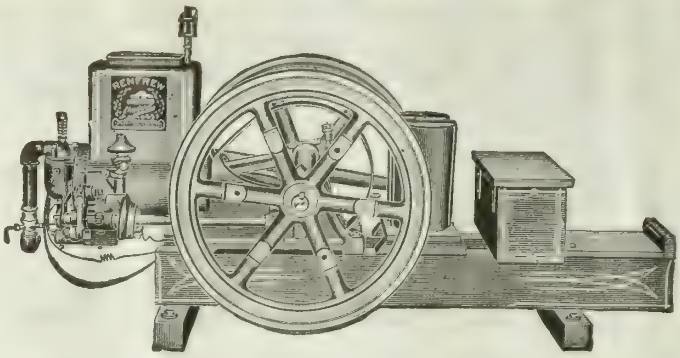
Penmans Underwear is made in all styles and weights for men, women and children.

Penmans Limited
Underwear, Hosiery, Sweaters
Paris, Ont.

Penmans Underwear

Pen Angle — Warranted High Grade — Penmans Knit Goods

All Penmans Products are Made-in-Canada.



Easy To Run. Takes Little Fuel

You need a gasoline engine on your farm. Old, back-breaking methods are too expensive and laborious. They waste too much time. And time is worth money to the busy farmer.

Renfrew Standard
It starts without cranking

The Renfrew Standard is a swift and willing worker. It's always "on the job". It costs very little to run. It is built especially for farm use. Strong, sturdy, with the metal so well distributed that the engine needs no anchoring. Smooth-running. All working parts machined with utmost accuracy and care. Search the continent over and you'll not find a better engine, or one that gives you more for your money. And we guarantee it—and stand solidly back of the guarantee. Satisfaction is assured every purchaser.

Engine catalog free on request. Write for it.

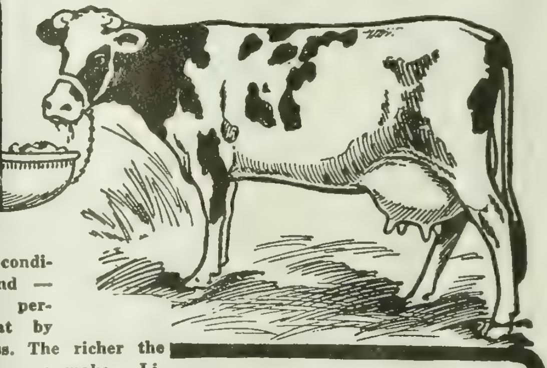
THE RENFREW MACHINERY Co. Limited
HEAD OFFICE AND WORKS, RENFREW, ONTARIO.
Agencies Almost Everywhere in Canada.

This Feed Costs Nothing

If you count the results it gives.

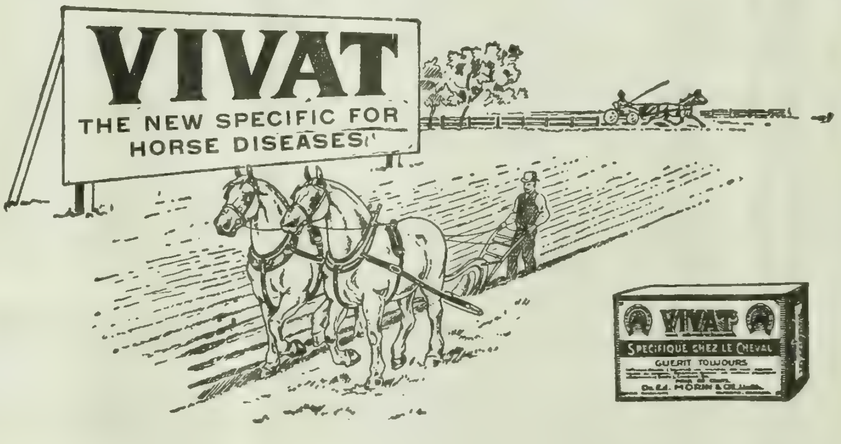
Livingston's Oil Cake is just what cows need.

It tastes good—is easily digested — keeps stock in prime condition all the year round — actually increases the percentage of Butter Fat by 16% over Pasture Grass. The richer the cream, the more money you make. Livingston's is the feed that pays for itself. 10



Write for free sample and prices. Dominion Linseed Oil Co., Limited, 31 Mill Street Montreal.

Livingston's Dairy Oil Cake


VIVAT
THE NEW SPECIFIC FOR HORSE DISEASES
VIVAT
SPECIFIQUE CHEZ LE CHEVAL
GUERIT TOUJOURS
Dr. Ed. MORIN & Cie

Always Cures: Cold, Broken Wind, Colics, Urine Retention, Intestinal Worms.

Ask for the FREE VETERINARY BOOKLET published by

Dr. ED. MORIN & CO., LIMITED, QUEBEC, Can.

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 99,695
ENGLISH, 9,820
FRENCH, 89,875

Volume 18
MAY 1st 1915
Number 11

EDITORIAL

To the Secretaries of Agricultural Societies and Clubs

LISTS OF SUBSCRIBERS TO THE JOURNAL OF AGRICULTURE

IMPORTANT NOTICE

TO prevent any irregularity in the delivery of the "Journal of Agriculture" to the members of Agricultural Societies and Clubs, you are earnestly requested to inform us as soon as possible of the changes occurring this year among the members on your respective lists; that is to say, the names and addresses to be added or left out.

Until you inform us of these changes the Journal will be distributed according to the old list of subscribers.

The list of the names to be added or cut out must be forwarded before the coming month of July, the date of the next subscription year of this Journal, to Mr. OSCAR LESSARD, Sec., Council of Agriculture, Dept. of Agriculture, Quebec.

AGRICULTURAL MERIT COMPETITION FOR 1915

District No. 1.—Official Notice

THE Agricultural Merit Competition will take place this year in District No. 1 of this province, including the following counties:—

Jacques Cartier, Hochelaga, Laval, Two Mountains, Soulanges, Vaudreuil, and the parishes and townships of Argenteuil and Terrebonne counties which are not included in the Laurentides.

Farmers wishing to take part in this competition may make application to the Minister of Agriculture, Quebec, from now up to the 15th June, at the latest, on forms to be supplied by the Minister for that purpose.

No applications received later than June 15th will be considered.

Winners in this district of the Silver Medal and the diploma of Very Great Merit in 1910 are reminded that they have the right to compete this year for the Gold Medal and the Diploma of Highest Merit.

ADVICE FOR THE FARMER

PERHAPS never before in the history of Canada are there so many persons, wise and otherwise, writing, speaking and advising the farmer how to increase Production. He is looking on quite calmly, extracting from the deluge of information whatever is valuable and applicable under his conditions. Solomon has said: "In multitude of counsellors there is safety", but he lived in a different time from the present.

If the farmer can be exhorted to read and study more of the valuable bulletins, published and sent out free by the federal Department of Agriculture, the present agitation will have accomplished something of real value to the country. As a rule, farmers do not read the bulletins. Sometimes the fault lies with the writers of the bulletins, who either did not or could not express what they wanted to say in language that the working man understands. Sometimes, and perhaps very frequently, the fault lies with the farmer himself who does not take sufficient interest in his work to wish to know what information experts have to give him.

It is fortunate, however, that the farmers are beginning to read carefully the valuable articles that appear either weekly or monthly in our better agricultural papers. There the substance of the bulletins usually appears in a form that is readily understood by the readers.

CO-OPERATION AMONG THE FARMERS

IT is now generally conceded, in theory at least, that co-operation as a working principle is as important for the farmer as it is for the city business man. Considerable attention was given by the press before the war to the need of bringing the producer and the consumer more closely together to keep down the fast-rising prices of the necessaries of life. As a result a federal Commission was appointed more than a year ago to take evidence and to bring in a recommendation to the Government as to the cause or causes of the high cost of living and the most practicable means of dealing with the situation. For the present, we believe, the work of the Commission has been suspended, but nevertheless co-operation is making headway among the farmers of Quebec, one of the latest formed associations being the "Quebec Seed-growers' Co-operative Association" of Ste. Rosalie, Bagot Co., described by Mr. Gigault in the last number of the *Journal of Agriculture.*

The farmers are becoming convinced that only by co-operation can they expect to get reasonable profits and returns from their capital and labor. It is computed that it requires only eleven hours labor to produce a bale of hay although thirty years ago it required thirty-five hours, but the farmer has not benefited to any appreciable extent by the change.

Dr. Galloway, Dean of the College of Agriculture, Cornell University, speaking recently on this subject said: 'If Agriculture is to continue to prosper under a democratic form of government, if we are to be a nation of free men of the soil, if we are to avoid coming to what all other nations of the past have come to—an agricultural peasantry — we must organize industry, and that means co-operation."

Co-operation, however, must not be forced; it must come spontaneously from the farmers themselves. All this means patient leadership by men who do things but talk very little about them, and these are hard to find. Until such leaders appear the Department of Agriculture must act as guide, counsellor and friend to communities reaching out after co-operation. The farmer is neither a capitalist nor a manager of industry, although often he thinks he is. Business is organized by other hands than his, and it will require time, training and experience to make him equal to his city cousin as a business man.

OVER-PRODUCTION OF FRUIT

MR. Johnson, Dominion Fruit Commissioner, after a trip from coast to coast last summer, comes to the conclusion that unless tree-planting is greatly restricted Canada will suffer from an over-production of fruit. He says there are enough fruit trees planted to supply Canada's needs for many years to come.

While we believe Mr. Johnson's observations are correct, and that many large young orchards have been recently planted all over the country, especially in the West, we venture to come to a different conclusion. Many orchards have been planted by speculators in districts far removed from markets. These orchards will never pay, and there will be over-production in such districts. Again, many varieties of apples are more or less localised in their growth, and any attempts to grow these varieties out of their special locality will be hazardous as they will not be able to compete in the markets where they are best known.

Coming to our own Province, does any person imagine that the present orchards of Quebec and Eastern Ontario are able to supply the demand in Montreal for McIntosh and Fameuse? As early as December 2nd last it was impossible to locate No. 1 McIntosh and Fameuse in any large lot, the price offered being $1.50 to $2.00 per box and up to $5.50 per barrel. McIntosh apples grown in Montana were sold in carload lots in November and December on the Montreal market.

The great trouble at present in fruit production is the lack of proper marketing arrangements. Fruit was rotting in orchards last fall, and not far away were thousands of householders clamoring for it. Towns and cities are unequally supplied with fruit, a glut occurring in one place and a scarcity in another at the same time. By proper organization we believe ten times the present quantity of fruit would be used by Canadian consumers. The large importations of oranges and bananas from Florida and California in recent years, crowding out the apple in many homes, may be set down to the fine organization on the one hand and the poor organization on the other.

So far as Quebec fruit-growers are concerned they can afford to plant new orchards for years to come to replace the old worn-out ones and to provide a supply of good Fameuse and McIntosh apples which will always be in demand.

CONTENTS

EDITORIAL.—List of Subscribers.—Agricultural Merit Competition. — Advice for the Farmer. — Co-operation among the farmers.—Over production of fruit. — A satisfying rural life.—Farmers' excursions. — Maple syrup and sugar for the Canadian wounded.—United States school gardens.—The Red Cross appeal to the farmers.

ORCHARD AND GARDEN.—Sod v. clean cultivation in the orchard. — Spraying Apple trees. — Amount of spray required. — The raspberry and strawberry. — Annual Meeting of the Quebec Society for the Protection of Plants.

FARM AND FARM CROPS. — Alfalfa Seed production in Quebec.—Ensilage Corn production, (Continued). — Farm Weeds, (Continued).—Lime in Agriculture.—Patriotism and Production by a Farmer.—Cleaning and grading seed grain and flax.—Methods and rates of planting corn.—Quebec Seed Growers Co-operative Association.—Drinking water. — Clover and Grass seed.—Farm Labour and Weeds.—Field root and vegetable seed situation.

LIVE STOCK.—A profitable type of milch cow. —For Sale. — Sheep husbandry. — Sheep Breeders' and Wool Growers' Association. — Spring Management of breeding ewes. — Ayrshires sell well at Springburn.—Seasonable hints. —Experimental Farm's report. — When is hog-raising profitable? The Grey Nuns' barn at St. Laurent.—Record of performance test, Ayrshires.

DAIRY.—Progress in co-operation.—The new dairy industry law.—Should farms selling milk to cheese factories be inspected ? Good profits.—The cow's individuality.—What do your cows test?—Raising heifer calves.—Score card for dairy farmers.

POULTRY.—More poultry needed.—The growing stock.—Artificial incubation and brooding.

WOMAN'S WORLD.—Correction.—Foods and Food Preservation.—Come, let us live with our children (Continued).—On weeding.

GENERAL INTEREST.—Breeding dairy cattle. — Sheep raising.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

A SATISFYING RURAL LIFE

WITH the closing of the Agricultural Colleges several hundred young Canadians are back again on the old farm, helping as best they can to make it a satisfying proposition—financially, socially and intellectually.

This conception of farming, strange to say, is comparatively modern. In some old-world countries to-day the tillers of the land are peasants, living under conditions not far removed from the domestic animals they feed. Muscle, not brains, works the land. The toilers work either under orders or according to rule, and it has not occurred to the leaders that an educated intelligence is as necessary in dealing with the soil, crops and animals as with matters of law or the church.

During the last half century, however, a decided change has taken place in man's conception of the equipment of the cultivators of the soil. This change was due largely to two main factors, namely, the development of industries in cities and the rise of agricultural colleges and experiment stations. The rise of urban industries gradually drew the surplus population from the country, and introduced new and disturbing elements into rural life, namely scarcity of labour and dissatisfaction with social conditions.

However, with the advent of agricultural colleges rural life has entered upon a new and, we believe, upon a better plane of existence. The coming farmer is one who will find satisfaction in his profession, combining, as he must, manual with brain work. Brains and muscle will now work the land. As an educated man he will find pleasure in trying to solve the problems that everywhere confront him—social, religious, educational and scientific. Improvement of his own and of his community conditions will furnish him plenty of scope for his activities.

A satisfying rural life implies opportunities for the expression of the best qualities of the community. It is a well known principle in plant and animal breeding that the best natural qualities find expression when the surroundings are favourable to their development. What, then, are the main factors in a satisfying rural life? They are in our judgment, first, farming itself must be profitable; second, social life must be full of recreations that are healthful and elevating; third, school work must be a preparation for rural life in the best sense of the term, giving the young people an interest in farm life and a desire to remain on the farm on account of its satisfactions.

It seems to us that much may be expected from the young men and women on their return to the farm. While at College they have had glimpses of the country with the satisfying opportunities we have just mentioned, and we will look to them to begin the great work of making rural life what it should be.

FARMERS' EXCURSIONS

EXCURSIONS organized by agricultural societies, farmers' clubs, etc., are invited to Macdonald College in the month of June to inspect the work in progress in the various departments—the main farm, the stables, cereal plots, the orchards and vegetable gardens, the greenhouses, the poultry plant, the dairy, and the scientific laboratories. For the women especially there is the inspection of the School of Household Science, and arrangements are sometimes made for a demonstration in one of its departments—as, for instance, in some branch of cooking, needlework, laundrying, household furnishings, etc. For the women also, a demonstration in the home dairying department, in butter or soft cheese-making, is usually provided. An opportunity is also given to inspect the residences, the dining-room, the gymnasia, etc., and thereby to understand to some extent the conditions of student life at the College. Luncheon, if the weather is fine, may be eaten, in picnic fashion, on the campus; otherwise, accommodation indoors will be provided. A light luncheon, including sandwiches, bread and butter, cheese and hot tea, is provided free to excursions of farmers from the Province of Quebec. Excursion parties will be met at the railway station, conducted to the assembly hall, where the Principal, or his representative, will address the excursionists on some of the particular attractions of the programme of the day. For all such excursions, arrangements, in advance, should be made as to a date convenient to the College, etc. Address: The Principal, Macdonald College, P.Q. Applications for special rates for such excursions should be made to the railway companies as far in advance as practicable.

MAPLE SYRUP AND SUGAR FOR THE CANADIAN WOUNDED

IN a letter to Mr. H. B. Yates, President of the Quebec Provincial Branch of the Canadian Red Cross Society, Lt.-Col. Charles W. F. Gorrell, the officer in command of the Duchess of Connaught Hospital at Clivedon, England, the chief base hospital for the Canadian wounded, wrote in March:

"I am out begging from my friends in Canada "and the States for support, in the line of Canadian grub for the patients of this hospital. We "are now filled to the doors with sick and wounded, "and are doing our best to make all happy. We "hope to commence, next week, to build an addition "for five hundred more Canadians.

"Am I asking too much of you to send us some "of your maple products, both sugar and syrup? "We opened a case from home the other day and "found a few cakes of maple sugar in it. The men "went fairly crazy with delight, when it was given "to them. It was because I saw their great pleasure "that I am emboldened to ask you if you will contribute some of your valuable product, to the "comfort of our sick and wounded. I suppose the "spring tapping will soon begin."

Now here is a rare opportunity for our maple syrup and sugar makers to do a service at once to those who have been wounded in the defence of our common liberties, to their country, and to the maple syrup industry itself. For what more effective advertisement of the merits of maple products could possibly be conceived than is here afforded? Men who taste maple syrup or sugar under such conditions will be friends of the industry for ever. And these characteristic Canadian products will no doubt be brought to the attention of many to whom they have hitherto been unknown.

What is proposed is that every producer of maple goods should donate either one gallon of syrup or ten pounds of sugar to the Canadian Red Cross for the use of the wounded. In this way it is hoped to collect and forward ten thousand gallons of syrup or its equivalent in syrup and sugar.

In order that this may be accomplished the response on the part of the producer must be general and immediate. We trust our Quebec producers will distinguish themselves in the heartiness of their response to this appeal from the Canadian Red Cross.

Shipping tags may be obtained of the Red Cross headquarters at Montreal or of Mr. John H. Grimm, 58 Wellington Street, Montreal. All that the donor of the syrup or sugar has to do is to write his name on the tag, and deliver the tagged syrup can or parcel of sugar to the nearest Express Agent, who will give him a receipt and forward the parcel.

THE GARDEN AND ORCHARD

SOD VERSUS CLEAN CULTIVATION IN THE ORCHARD

OVER 90% of the apple orchards in the province of Quebec are in sod and unfortunately the sod is either pastured or the hay cut and removed. A small percentage of the orchards are cultivated in the spring and seeded down to a cover crop in late June or early July and undoubtedly among this smaller percentage are to be found all the better orchards of the province. It is also a conservative estimate to say that there are not over five good orchards in Quebec in sod to-day and that have been in sod for the past ten years.

Many of these sod orchards will be plowed during the latter part of April and before the middle of May of this year, the owners having realized the necessity of cultivating their trees if they expect to get full crops of good apples.

In plowing an old sod orchard plow as early as possible, not going any deeper than necessary, three or four inches is sufficient, and immediately after plowing commence with the disc, and disc thoroughly. Disc or cultivate frequently until the end of June, but in cultivating be careful not to turn the sod up on top where it will not rot and decay. At the end of June sow a cover crop, crimson clover is good, seed at the rate of 20 to 25 pounds per acre.

It is not necessary to plow close up to the trunks of the trees provided the grass and any weeds about the trees are cut two or three times during the season.

Cultivation will do far more than manuring or fertilizing in many cases; and it should be one of the first steps in improving the orchard. Best results in spraying cannot be obtained from uncultivated orchards. Cultivation improves the color of the foliage, makes it healthier, increases rate of wood growth, induces fruit production and tends to make the trees bear annually, especially where attention is given to pruning and spraying. The three main essentials in growing a good crop of apples to-day are: Prune, Spray, and Cultivate.

T. G. BUNTING,

Macdonald College

UNITED STATES SCHOOL GARDENS

THE most potent remedy for the present social and economic unrest is scientific, cooperative, intensive farming, and the natural and most effective preparation for intensive Agriculture is the school garden, including the school-gound demonstration garden, the city back-yard home garden, the rural school project, the boy farmer club for placing city boys on farms during Summer vacation, and other Agricultural activities administered by school authorities and correlated with school work.

The introduction of the school garden by rational methods and with proper limitations and adjustments does not mean the displacement of the three Rs as the basis of sound learning, or the substitution of cash instead of character as the true aim of education. Dr. Claxton, Commissioner of education for the United States, recently said : "Culture is that intangible something that comes from intelligent labor, rendered in the service of our fellow-men". Such a spirit in school garden work gives it a distinct culture value.

In 1885 the Cook Co. Normal School garden was the only one in America. To-day there are a number of cities, e.g. Philadelphia, in which every school has a school-garden. In Los Angeles there are 22 Agricultural Directors whose chief duty is to supervise and assist in school-garden work. Fresno, Cal. has a Field Deputy Superintendent who spends his entire time in school garden work. At Dayton, Ohio, the city School Superintendent arranges with farmers to take city school-boys as assistants on the farm during Summer holidays. Near LaFayette, Miss. is a rural High School with a farm of eighty acres; the farmer has a classroom in the building and the pupils work on the farm with him in the afternoon. These are illustrations of the fact that after thirty years of experimentation, wise and otherwise, the school garden (in some form or other) has become an organized part of the national educational system of the United States.

It has been found that for best results the teacher must be a practical gardener and should have a private garden of his or her own. The teacher should have had both agricultural and professional training.

In cities good results have been secured from the appointment of such specialist teacher for each large school to teach Nature Study Agriculture, and supervise garden work during the summer vacation as well as school days. In a number of States Rural School Teachers are trained in Rural Normal Schools.

The most satisfactory prize for children's work is that which comes from the ability to furnish their home table with vegetables and flowers and to purchase books with the money received from the surplus product of their own gardens.

Seventeen hundred children in Dayton, Ohio, were given seeds which they planted under supervision in back yard home gardens, ten feet by twenty-five feet in area. One model garden in each school district served as a guide to the work. The children not only kept their family tables well supplied but, in many cases, sold the surplus product.

The needs of the present situation are such that every Canadian child, who is able, should do some garden work this year.

S. B. SINCLAIR

A RED CROSS APPEAL TO THE FARMERS

OUR country, with its Allies, is waging a great war for justice, for the protection of small nations in the enjoyment of their rights, for continued and growing freedom, and for the maintenance of its pledged word of honour. Much destruction and desolation are being caused. Lives are being lost by the thousand. Canada's first contingent is now in the thick of it. Some will fall sick; many may be wounded; some will pay the last full measure of devotion to their country and its cause.

The Red Cross Society exists to succor the sick and wounded in war. It needs more money to provide more beds at hospitals in Great Britain and France; it needs more money to pay more Red Cross Nurses; it needs more money, and more things made by women, to supply to Clearing Hospitals, Base Hospitals, and Recovering Hospitals.

I appeal to farmers to send me sums from $1 to $50, during the first week in May. Every $50 provides one additional hospital bed with the giver's name over it. By sending me about $10,000, you would serve your country well, bring credit to yourselves, and make all of us very proud of you. For the sake of the wounded boys, make the gift substantial. It will be an investment towards the recovery of some Canadian soldier who stood in our stead that our cause might be upheld.

Faithfully your friend,

JAS. W. ROBERTSON,

Chairman,

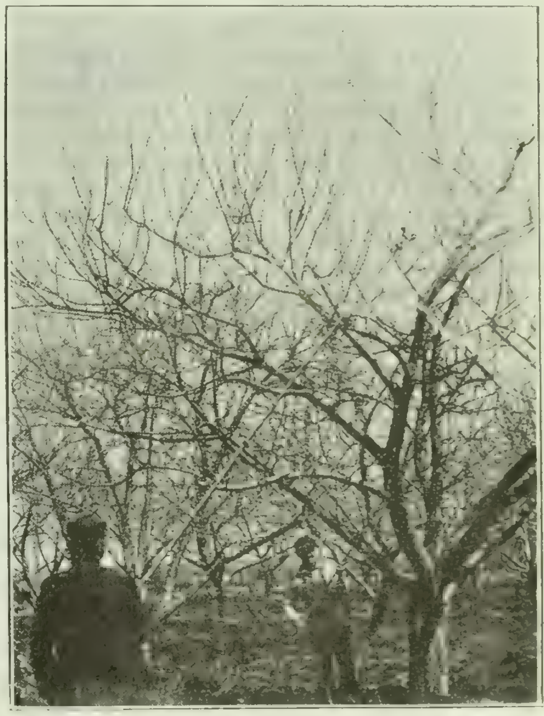
Red Cross Society at Ottawa

SPRAYING APPLE TREES.—AMOUNT OF SPRAY REQUIRED

IT is desirable that the fruit-grower should determine in advance of spraying just what quantity of material will be required to spray his orchard so that he can order a sufficient supply before the spraying season commences. This often saves delay during the spraying season and sometimes a few days delay may mean serious loss.

Very little definite information on this point is available as fruit-growers in general do not keep such records. However during the past two years a careful record of quantity of liquid required to spray trees of a given size and age has been kept at Macdonald College. These records were taken in two orchards, one of seventy trees thirty years old and the other of sixteen hundred trees nine years old. The trees are illustrated with this article in order to indicate their size.

The nine year old trees required on an average 1¼ gallons of liquid per tree for the dormant spraying and 1 gallon per tree for each of the other two sprayings. The liquid was put on a little heavier in the first spraying: The thirty year old trees required approximately five gallons of liquid per tree for the dormant spraying and about three and a half gallons for the two subsequent sprayings.



A thirty-year-old tree requiring 5 gallons for dormant spray and 4 gallons for each of the second and third sprayings.

The above sprayings were given with a power sprayer operating at 175 pounds pressure with two nozzles per line and the men handling the lines of hose working rapidly. At a lower pressure or with only one nozzle per line more liquid would be required to spray a given tree and in addition to this, much would depend on the men handling the hose. The trees do not have to be drenched and dripping, but all parts of the limbs including the smallest twigs should be thoroughly covered with spray and

A nine-year-old tree requiring 1¼ gallons of liquid for dormant spraying and 1 gallon for each of the second and third sprayings.

in doing the work thoroughly some liquid will be wasted. If the wind is high at the time of spraying it will be necessary to go over the orchard again when the wind is blowing in the opposite direction, but if the wind is light the entire tree may be covered easily at the one time.

From the above information one can easily determine the approximate amount of liquid required to spray a given number of trees. The commercial concentrated lime-sulphur solution usually tests from 1.30 sp. gr. to 1.32 sp. gr. and should be diluted about 1 to 9; that is, a forty gallon barrel of the concentrated solution will make four hundred gallons of the dormant spray of 1.03 sp. gr., or the home made concentrated solution will make about two-thirds of this amount depending on its specific gravity as determined by the lime-sulphur hydrometer.

The second spray given just before the flower buds open is only one-third the strength of the dormant spray, therefore one forty gallon barrel of commercial concentrated lime-sulphur will make about twelve hundred gallons of spray of the strength 1.0 1 sp. gr. or if the home made concentrated solution is used it will make about eight hundred gallons.

The third and subsequent sprays are slightly weaker than the second spray and may be diluted with one-ninth more water.

Arsenate of lead is used in the second and third sprayings at the rate of two and a half pounds to forty gallons of liquid.

All fruit-growers should determine in advance just what quantity of all spraying materials he is likely to need so that he can avoid ordering a surplus or running short and thus be put to the delay and inconvenience of ordering additional supplies in the midst of the spraying campaign.

If several growers situated conveniently to each other would co-operate in ordering their supplies it would be found to be much cheaper for them, and then if one would make the lime-sulphur for all a further saving would be made.

The lime-sulphur and arsenate of lead are the most satisfactory sprays for the orchard to-day. and are recommended above all others as a general fungicide and insecticide. Black leaf forty is used where the aphis become serious and it may be combined with the lime-sulphur when necessary.

We have been making the lime-sulphur solution at the college for the past few years and although we do not get as high a specific gravity in the home made solution as in the commercial solution we can make it at about half to two-thirds the cost when comparing the actual spraying value, after allowing for cost of labour and fuel for boiling. However for the man only requiring a barrel of the concentrated solution it would probably pay him to buy it ready made.

Full details of the home manufacture of the lime-sulphur solution were given in last month's issue of the Journal.

T. G. BUNTING,

THE RASPBERRY AND STRAWBERRY

EARLY May is the proper time to plant new plantations of these fruits. If the old plantation of raspberries has become unprofitable a new one should be started, and the third year after planting a good crop of fruit should be secured.

The strawberry is usually handled as a biennial crop and only one crop taken from the patch, but some people prefer to take two or more pickings from each planting. However it is well to have a small plantation coming on each year as they will usually do better than the older plantations. The earlier they are planted and the better the condition of soil, the better will be the results with both of these fruits.

T. G. BUNTING,

ANNUAL MEETING OF THE QUEBEC SOCIETY FOR THE PROTECTION OF PLANTS

Held at Macdonald College March 11th; a Good Attendance

THE seventh Annual Meeting of the Quebec Society for the Protection of Plants was the most successful in its history. The addresses given were full of interest, and contained much valuable information on the control of injurious insects, plant diseases and weeds. The following members were present: J. C. Chapais, St. Denis-en-bas, Father Leopold, Bro. Benjamin and eight senior students of the Oka Agricultural Institute; Revs. Fontanel and Soucie of Ste. Marie College; Revs. Keating and Corcoran of Loyola College, Montreal; Professor Adams, and Messrs Strickland and Chrystal of Ottawa; A. F. Winn and G. A. Moore of Montreal; Dr. Harrison, Professors Lochhead, Bunting, Murray, Fraser; Messrs P. I. Bryce, A. C. Gorham, E. M. DuPorte, and many students, of Macdonald College.

Letters of regret at inability to attend the meeting were received from Rev. Abbé Huard of Quebec, Dr. R. Campbell of Montreal, Dr. C. G. Hewitt, A. Gibson, J. M. Swaine, Rev. Dr. Fyles and H. T. Gussow of Ottawa, and G. C. Piché of Quebec.

Papers and Addresses

Mr. J. C. Chapais read a report as delegate from the Society to the Annual Meeting of the Ontario Entomological Society in Toronto last November. He also read an interesting paper on *Aphrophora Spumaria*, the common spittle insect which forms the common frothy spittle mass on grass in meadows, describing its life-history and habits.

Mr. DuPorte read an interesting paper prepared by Brother Victorin of Longueuil College on "Some Silent Invaders of our Fields", in which a warning was given regarding some weeds that were entering the province, and were likely to become serious pests if timely action were not taken.

Mr. Strickland of the Entomological Branch, Ottawa, gave a valuable address with lantern slides on the Inspection and other work carried on by the Branch against the Brown-tail Moth in New Brunswick and Nova Scotia.

Father Leopold read a most interesting paper on the Woolly Aphis in the Province of Quebec in which he showed clearly that while this insect was present in the province, its work was not severe, and that a strict enforcement of the Noxious Pests Act was neither necessary nor in the best interests of the fruit-grower. In other provinces and States orchards and nurseries were not inspected for the woolly aphis. Professors Crosby of Cornell and Lochhead and Bunting of Macdonald agreed with the views expressed by Father Leopold, and a Resolution was passed by the Society asking the Minister of Agriculture to allow the shipment of nursery stock free from woolly aphis from nurseries where it is found that only a few trees are infested.

Mr. Chrystal of the Entomological Branch, Ottawa, gave an excellent address, illustrated with lantern views, on the Ravages of Insects in Stanley Park, Vancouver, with suggestions for their control.

Professor John Adams, Assistant Dominion Botanist, C. E. F. Ottawa, read an interesting paper on "The Medicinal Plants of Quebec" in which he gave a list of such plants and outlined proper methods of gathering and curing them. He showed that with proper attention a profitable industry might be established.

Professor Adams also read a paper prepared by Mr. H. T. Gussow, Dominion Botanist, on "Potato Diseases". A description of the chief diseases was given, with the best methods for their control.

In his presidential address Professor Lochhead discussed "The Web of Life" in which he tried to

THE FARM AND FARM CROPS

ALFALFA SEED PRODUCTION IN QUEBEC

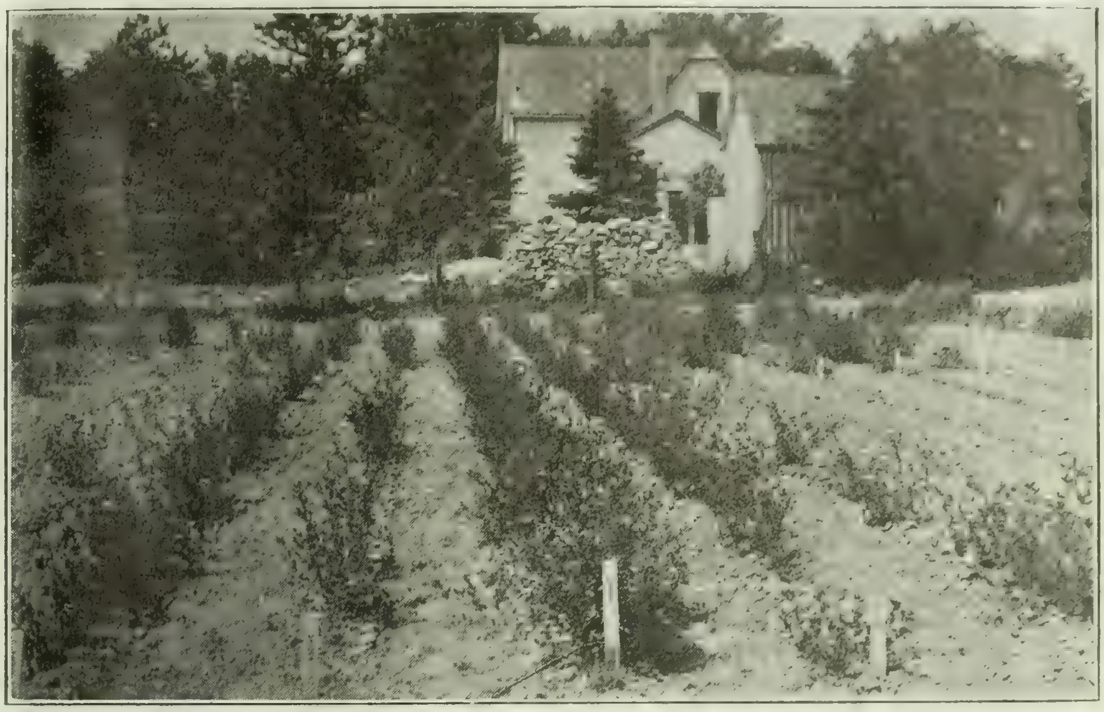
OF the many factors that contribute to the successful growth of alfalfa in Quebec one of the most important is the *selection of seed of a hardy variety.* Failures in the past have been due in many, if not in most cases, to the use of seed that is lacking in this particular quality.

While it is true that certain varieties including Grimm and Ontario variegated are recognized as being hardier than others, a great deal of alfalfa seed lacking this desired character has been imported and used for seeding purposes. Much of this seed comes from the milder States of the Union, and from the milder countries of Europe where conditions are favorable for seed production in large quantities, but where hardiness is not an important factor. Seed from such sources cannot be expected to withstand our winters and although it may come through the first and even the second winter if conditions are extremely favorable, it will sooner rather than later be winter-killed. Unless one of the hardier varieties of alfalfa is used, it is a doubtful practice to try to grow alfalfa in this province.

A considerable amount of alfalfa seed is produced in Ontario and in parts of the prairie provinces of Canada. Seed from hardy varieties produced here will prove at present the best adapted to our conditions, but even in these sections conditions are not similar and are hardly as severe as they are in Quebec. Moreover the amount of dependable seed has been so limited that it has not been possible to get it at a reasonable price. In spite of the fact that Grimm alfalfa has been recognized since 1905 as being the hardiest variety on the market it is being sold this year at as much as one dollar and ten cents a pound and in no case at less than seventy five cents a pound. This means that if we are going to grow alfalfa most successfully in Quebec we must grow our own seed if such is at all possible.

Production of Alfalfa seed in Quebec

Few experiments in alfalfa seed growing have as yet been conducted in this province but from the experience obtained by the Cereal Husbandry Department of Macdonald College, alfalfa seed may be produced with profit, occasionally, if not in most years, providing the fundamental essentials of alfalfa seed production are recognized and put into practice.



Showing Grimm Alfalfa in centre alongside of ordinary Alfalfa. Grimm is much hardier.

The following yields of alfalfa seed show the results of a number of experiments in producing alfalfa seed in 1914 and serve to indicate at least some of the practices that must be followed if good results are to be obtained.

Experiment in Methods of Seeding:—

Alfalfa broadcasted	gave 42 lbs per acre.
" in rows 24 in. apart	" 141 " " "
" " " 32 " "	" 160 " " "

Experiment in Rates of Seeding:—

Alfalfa in rows	15 lbs. per acre	gave 68 lbs seed
" "	12 " "	" 80 " "
" "	9 " "	" 95 " "
" "	6 " "	" 113 " "
" "	3 " "	" 125 " "

Climatic conditions in Quebec are not ideal for seed production in that our seasons are comparatively short and a considerable amount of rainy weather occurs during the latter part of August and first part of September when alfalfa seed should normally be developing. Warm dry weather at the time of fertilization and seed formation is absolutely necessary to good seed yield. Too much moisture will cause an extraordinary growth of foliage and will result in a low yield of seed of poor quality.

By cutting the first crop of alfalfa early, the second crop will arrive at the proper stage for fertilizing during July and seed development will take place in early August. Conditions at this time are as a rule favorable for the production of good seed. Alfalfa that is intended for seed should be cut during the first week in June and never later than the tenth of that month.

Preparation of land.—In preparing land for the production of alfalfa seed the fundamental requirements are the same as when it is being grown for hay. The soil should be well drained, sweet, rich and above all it should be free from weeds.

Growing in rows. — The growing of alfalfa in rows has many advantages over broadcasting when

Showing Alfalfa set out in rows for seed, to allow of cultivation to control weeds and moisture.

---

show that all Nature is full of inter-relations, forming a series of linkages so that one form is dependent upon others. Disturbance of any part of this web is likely to be followed by disturbances in other parts. Many examples were given of these inter-relations in Nature, and their economic importance to man.

Professor Crosby of Cornell University gave a most valuable illustrated address on "Some Successes and Failures in Controlling Insects". He confined his remarks mainly to his experimental spraying operations in 1913 and 1914 against Leaf-rollers, Codling Worms, and Red Bugs in the orchards of New York State.

He showed the possibilities of the dust-spray in dealing with the first two insects. He thought the dust-spray with sulphur and arsenate of lead would soon become a valuable auxiliary to the liquid spray in the control of orchard pests.

On account of lack of time a paper by Mr, DuPorte on "The Parasites of the Bud Moth", one by Mr. Bryce on "Immunity of Orchard Trees from Disease", one by Professor Fraser on "Cereal Rusts" and one by A. F. Winn on "Books about Butterflies" were read by title only. They will appear, however, in the forthcoming Annual Report of the Society.

A sheaf of Alfalfa in seed, taken straight from the mower.

seed production is aimed at. Moisture may be controlled by cultivation and weeds may be kept in check. The growth of the crop is much more rapid, and it is possible to take the first crop off early with little sacrifice to the yield of hay; the second crop will be better developed and will reach the blossoming stage earlier than when sown broadcasted. Cultivation further encourages branching and as most of the seed is borne on the branches rather than on the main stem this has a decided influence on the yield of seed. The most suitable distance between the rows is thirty inches as this is the closest distance that will allow of easy and proper cultivation.

Amount of seed. — While fifteen to twenty pounds of seed is necessary when alfalfa is broadcasted for hay, three to four pounds is ample when grown in rows for seed at the above distance. If it is sown more thickly the crowded condition of the plants make it that they do not develop properly and branching is discouraged. There is also too much competition for plant food and moisture, with the result that a low yield of seed of poor quality is produced. A thin stand is absolutely necessary in alfalfa seed production if best results are to be obtained.

A hand root-seeder is the best implement for seeding a small acreage. If, however, a large acreage is being put in the drill seeder may be used. By blocking up four out of every five spouts and connecting the fifth one to the disc by means of a rubber hose seeding may easily be accomplished.

Time of seeding.—On well prepared land, clean and free from weeds seeding may take place any time before June tenth. If sown quite early it is frequently possible to obtain a crop of alfalfa the first year, but it is a safer practice to clip if off once or twice during the summer, but leaving 10 to 12 inches to freeze down in the fall for winter protection. Late June or early July seeding often proves disastrous on account of insufficient moisture for germination, while July or August seedlings are apt to have insufficient growth or be too succulent to go into the winter in best condition. The land must, however, be well prepared and free from weeds before seeding takes place.

Two or three cultivations are necessary during the first summer to control weeds, to conserve moisture, and to give the plants a start, but when a stand has been gotten, cultivation is only necessary when weeds or lack of moisture demand it.

If the first crop of alfalfa is cut for hay early in June as suggested above, with favorable weather the seed should be ready for harvesting during the latter part of August. The exact date for harvesting varies with the seasons and must necessarily be a matter of judgment. It should be cut when about three quarters of the pods have turned brown and before any appreciable number of the pods have dropped off.

Cutting.—Cutting may be accomplished with a binder, reaper or mower. The ordinary mowing machine with a table attachment to the cutterbar furnishes a simple and effective method. This allows a man to follow behind the machine and remove the alfalfa in small bunches to where it will not be trampled by horses or mower on the next round. An occasional turn of these bunches is necessary to allow of drying quickly. After proper drying the crop should be removed to the barn and stored until the sharp frosty days of winter.

Threshing.—Although not as hard to thresh as red clover, the clover huller is without doubt the best implement for threshing alfalfa on a large scale. The ordinary thresher, however, will do effective work if properly arranged. The inlet to the cylinder should be partially blocked so that the alfalfa must be fed into the mill in a thin layer, and the outlet must be partly closed to keep the alfalfa in close contact with the cylinder for a comparatively long time. Most of the seed will be removed in this manner but if some seed still remains it will be necessary to put it through the second time. This however, will rarely happen if the alfalfa has been properly cured.

If wet weather prevails during August and early September little hope can be entertained of a successful crop of seed, and in such cases it is much better to cut the alfalfa for hay or ensilage rather than lose a fodder crop and also get no seed.

Summary. — Good soil conditions, Grimm seed sown thinly in rows, cultivation to control weeds and moisture, followed by early cutting of the first crop and proper methods of harvesting are essentials to successful alfalfa seed production in Quebec. If the above precautions are taken it should be possible to produce sufficient seed for home use. This would insure reliable seed of a hardy variety grown under our own conditions and would go a long way towards placing alfalfa growing in this province on a plane which the merits of the crop deserve.

R. SUMMERBY,

Macdonald College

ENSILAGE CORN PRODUCTION

(Continued from April number.)

PLANTING

IN planting ensilage corn there are a number of factors which one should have definitely in mind. Chief among these are the *time, method* and *rate of planting.* All of these factors play an important part in the successful production of the crop.

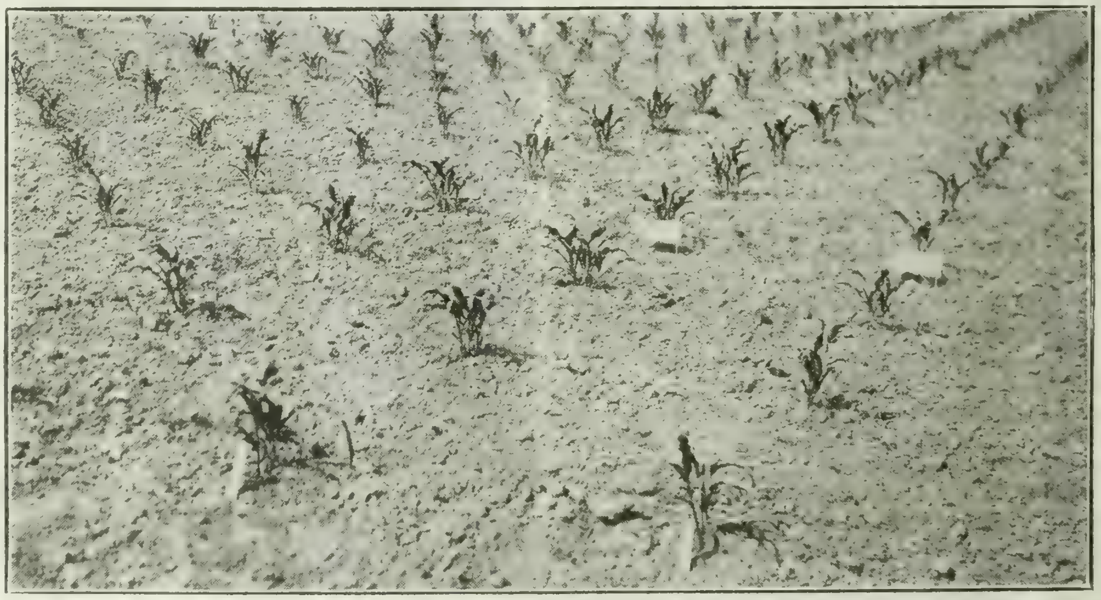
The proper time for planting will vary materially with the season and also with the district in which it is to be sown. No definite date can be given. The condition of the soil should be the guiding factor. Corn should never be planted till the soil is thoroughly warm and in a good state of tilth. Some districts are much later than others. It is much better to delay seeding than to plant under unfavorable conditions, as few things will check a corn crop more severely than to get a poor start due to a cold wet soil.

Two main methods of corn planting are commonly practised—drilling and check-rowing or hilling. Of the two the former is probably in much more common use throughout the country, due largely to the fact that until recently no reliable checking machines had been placed on the market. Both systems have their advocates and both have their advantages.

Drilling corn with the ordinary grain drill affords a very easy method of planting the crop. Corn planted in this way usually produces a slightly higher tonnage of forage per acre than by the check method. The development of quantity is made at the expense of quality, however, unless the plants are very thin in the row, and we invariably find that the corn is not nearly so well matured. Another very striking objection to the drill method of seeding is the difficulty of cleaning out the weeds at all thoroughly. It is impossible to cultivate closely enough to corn in drills to remove anything like all the weeds. This is particularly true with couch grass which tends to form a dense mass of roots right in the row, placing a serious handicap on the development of the corn crop.

Check-rowing on the other hand is not difficult if one will use care in the management of his machine. Odd shaped fields can readily be sown so as to afford comparatively straight rows both ways. Moreover by the check system the plants are given a much better chance to develop properly, and as a result we invariably get corn of greater maturity and better quality. Too often corn growers make an attempt to secure a high yield but pay little attention to maturity. Aside from greater maturity check-rowed corn has a distinct advantage over drilled in the thoroughness with which the soil can be cleaned. It is possible with corn planted in this way to run the cultivators through the corn in both directions, thus obtaining an excellent opportunity to eradicate any weeds that may be present.

Corn for ensilage should never be seeded too heavily. This is a common failing among growers in Quebec. Thick seeding always results in a sour



A field of Corn planted by the Check-row method. Note the possibility of clean cultivation.

watery ensilage of low feeding value. Such a custom may be advisable where the crop is to be cut and fed green as the stalks are usually finer and will be more thoroughly eaten by the cattle. For ensilage, however, one should always look for good ear development, for the grain itself constitutes an important factor in ensilage of high quality. By the drill method and with corn of good grading and high germination, from thirty to thirty-five pounds should be sufficient to seed an acre. This should be seeded in rows from three to three and one half feet apart and the corn finally thinned down so that the stalks will be from eight to ten inches apart in the rows. Check rowing requires less seed—from twenty to twenty-five pounds give a good stand. The hills should be placed at the same distance apart as the rows, in both directions, and from three to five stalks left in each hill after the corn has started to develop. It will, of course, be necessary to seed heavier than the exact stand that is finally desired, to allow for any unfavorable soil or weather conditions that may affect the stand adversely.

CULTIVATION AFTER PLANTING

On light soils or in dry years it is a good practice to follow the planter immediately with the roller. If in addition the field can be gone over with a spike harrow, the soil should be in ideal condition. The roller compacts the soil about the newly planted corn kernels, inducing a rapid and thorough germination; the harrows establish a mulch on the surface and prevent what would otherwise be a rapid evaporation of moisture, thus retaining it for the use of the crop.

With a large corn acreage such as the average dairyman has, necessity requires that the work be done as quickly and as economically as possible. This demands the use of large implements and a reduction as far as possible of the amount of human labor employed. To accomplish this the corn field should be cultivated at least twice after planting with the spike tooth harrow. More thorough work can be done in the early stages with this implement than with the harrow cultivator, since all the land will be stirred. As previously mentioned the rate of planting is heavier than is finally desired. Much of the necessary thinning can be accomplished by the spike harrow without serious damage to the rest of the crop. In drilled corn the harrows should always be run cross-wise of the rows. In check-row planting the direction should be alternated.

After the corn has reached a height of three or four inches all subsequent cultivation should be done with the double corn cultivator. The best makes of these machines are very adjustable and enable the operator to work up close to the plants without doing any damage. Cultivation with this implement should be relatively deep at first and gradually become more shallow. This practice is necessary because as the roots of the corn plant develop there is danger of cutting off many of the feeding roots by too deep working.

As already noted, in drilling corn cultivation must run in only one direction, thus making a much less thorough job. By the check-rowing or hill system the reverse is true and all the land is worked. Relatively more thorough work will be done if we cultivate only in one direction at any one time and follow with the succeeding cultivation, a week or ten days later, cross-wise of the previous direction.

The number of cultivations necessary depends largely on the weather and soil conditions. It will usually be about every ten days. The land should be worked sufficiently to preserve a mulch and keep down all weed growth; these factors should govern the frequency of cultivation.

There is little danger of working the soil too much. Corn responds readily to cultivation and will return a corresponding increase in yield. Work on the land should continue till the crop has become so high that there is danger of damaging it by the horses and cultivator.

In conclusion we should remember that a successful corn crop insures an abundant supply of cheap roughage feed, an asset of the highest value to the live stock farmer. To obtain it we must pay particular attention to the three important factors —soil—seed—and cultivation.

L. C. RAYMOND,

Macdonald College

FARM WEEDS

Article V

The Eradication of Special Weeds (Continued)

THE last article in this series dealt with the eradication of Couch Grass, Ox-eye Daisy and Perennial Sow-thistle. This article deals with Canada Thistle, Wild Mustard, Wild Carrot and Orange Hawkweed or Devil's Paint Brush.

(a) CANADA THISTLE

Just why this weed should be called the Canada Thistle is hard to explain for it did not originate in Canada, nor is it peculiar to Canada. It came from Europe and is found in nearly every part of temperate America.

Canada Thistle is a creeping perennial, and propagates both by creeping underground rootstocks and by seeds which are wind-blown. The rootstocks are often deep-seated in the soil, and possess the power of sending up many stems. Its presence in grain fields is harmful since it is a vigorous grower, and crowds out useful plants.

Canada thistle and its seed—a perennial with a creeping rootstock.

When a field is but slightly infested, pulling or grubbing is recommended, but when the thistles are numerous special cultivation is necessary. Experience shows that thistles are more readily killed when they are coming into flower than at any other time. In some parts of England the farmers have the following rhyme:—

> "Thistles cut in May
> Will grow next day;
> Cut in June
> Will grow again soon;
> Cut in July
> Will hardly die;
> But cut in August
> Die they must."

For Quebec conditions, however, July is considered the best month for mowing or plowing down thistles. An excellent plan is to mow the plants in flower, and to plow as soon as a new growth appears, followed by the broad-shared cultivator at intervals during the remainder of the season.

Common Mustard or Charlock—a very common annual weed.

Canada Thistle gives but little trouble on farms where a three or four year rotation is practised (clover — hay — root crops — grain crop). Care should be taken to sow clean oats, grass and clover seed for these often contain thistle seeds.

The double Cutaway disc harrow—very useful in preparing corn land. Here shown cultivating Alfalfa.

(b) WILD MUSTARD, CHARLOCK, HERRICK OR KEDLUCK

This weed occurs very abundantly in this province, and continues to spread at an alarming rate in many districts mainly due to the sowing of seed

Devils' Paint Brush has orange flower-heads, and produces mats, which crowd out other vegetation.

oats that are polluted with mustard seed.

Mustard is an annual plant and reproduces entirely by seed. In its early stage it is readily controlled by preventing the formation of seeds, and even if the seeds form and fall to the ground they can be eradicated by shallow after-harvest cultivation. The seeds in the soil will germinate after such cultivation, and the seedlings can be destroyed by harrowing. If this treatment is repeated at intervals through autumn and followed by a well cultivated root crop the next season mustard plants will not make their appearance afterwards.

If, however, the mustard seeds that have fallen to the ground are buried by the plow, they will remain dormant for several years. When the ground is again plowed some of the seeds are brought nearer the surface and will germinate. Only years of careful cultivation will rid the land of all the buried seeds.

Mustard plants growing in grain crops may be destroyed by spraying the fields with either blue stone or green vitriol solution. The blue stone solution should be of 2% strength, that is, 8 or 10 pounds dissolved in 40 gallons of water. The green vitriol solution should be a 20% solution, that is 80 to 100 pounds in 40 gallons of water. In either case the solution is applied as a spray on a clear day while the weeds are young or are just coming into bloom. A potato-spraying appliance is the best for the purpose.

Wild carrot, a Noxious biennial with a deep tap root.

It should be borne in mind, however, that the spraying of mustard plants will not destroy the seeds in the ground, so that freedom from the pest must not be expected from one season's spraying.

When only a few plants appear in a grain field hand-pulling is the most effective and cheapest method of eradication.

The use of the weeder or a special light harrow when the grain crops are not more than six weeks high is recommended by many farmers, for by this practice thousands of seedling mustards, and other weeds as well, will be destroyed.

(c) DEVIL'S PAINT BRUSH OR ORANGE HAWKWEED

This weed is practically everywhere in the Eastern Townships and has taken possession of rough lands and permanent pastures. In poorly cultivated lands Paint Brush is also abundant in many sections. It spreads by means of seeds, which are carried by the wind and by runners on or near the surface of the ground. Its habit of bearing leaves close to the ground enables it to crowd out other plants.

When good cultivation and a good rotation of crops are practised this weed is readily exterminated from arable land. When a meadow becomes badly infested it should be plowed shallow as soon as the hay crop is removed, rolled and harrowed, disk-harrowed thoroughly ten days later, cultivated at intervals until autumn, then plowed deeply just before winter sets in. If corn or hoed crops follow the next year and continuous cultivation be given through the season Paint Brush will be practically exterminated. It is important to manure the land well at this stage, and when seeding down to sow about 20 pounds of clover and grasses per acre.

In rough lands sheep will control Paint Brush, and this is practically the only method of dealing with the weed in such situations.

Plants in waste places and along roadsides should be mowed early to prevent the formation of seeds, for these may be carried by the wind to adjacent lands.

Some farmers have succeeded in killing Paint Brush by applying salt at the rate of 18 pounds to the square rod. This method, however, is practicable only on small areas.

(d) WILD CARROT OR BIRD'S NEST WEED

This biennial weed with a deep strong root is becoming a serious pest in many sections of the province, and is rather hard to eradicate. It produces a crown of leaves the first year, and flowering stalks the second year. Badly infested pasture fields or meadows should be plowed up and cultivated for a few years. By spudding or cutting wild carrot well below the crown of the root and by cutting them before they have a chance to produce seed the weed can be controlled in grain fields.

W. L.

LIME IN AGRICULTURE

ONE of the principal functions of the Chemical Division of the Dominion Experimental Farms is to attempt the solution of problems connected with the maintenance and upbuilding of soil-fertility.

Among the many valuable results so far obtained in these investigations is the demonstration of the vital part played by lime in the increase of a soil's productiveness.

The subject is treated in an interesting and practical way in Bulletin No. 80 of the Experimental Farms' regular series, by the Dominion Chemist, Dr. Frank T. Shutt, who discusses it under the following heads:—

The nature of lime and limestone.

The agricultural functions of lime and its compounds.

Comparative values of lime compounds.

The application of lime compounds.

The use and misuse of lime.

Those interested may obtain a copy of this bulletin by applying to the Publications Branch, Department of Agriculture, Ottawa.

PATRIOTISM AND PRODUCTION

By A Farmer

Editor, Journal of Agriculture,

THERE is something about this "Patriotism and Production" campaign, as carried forward by the newspapers, which touches many a thoughtful farmer's pride and arouses a spirit of resentment which he himself can hardly analyze. Why should he, above all other classes in the country, be called upon to listen to appeals of this nature? The association of the two words seems to question his interest in the present crisis, and at the same time to rebuke him for failure to respond to greater opportunities for increased profits.

Farmers are not lacking in patriotism more than any other class of citizens, and, we believe, are as fully alive to the needs of the Empire. No man likes to have his patriotism questioned, and most of us consider it of too sacred a nature to be advertised on the street corner or in the market place. Unhappily this cannot be said of our politicians and of many of our commercial interests.

Everyone feels competent to advise the farmer, and thinks it part of his duty as a patriot to prod on the man behind the plow. It never seems to occur to our smart city friends that it is just possible that the farmer knows his own business better than anyone else. Among town and city people there seems to be a conviction that farmers are making money through war conditions. The rise in wheat came after the farmers had sold their crop. Our grain growers of the West may sell their next crop for high prices — and they may not; at any rate they are doing their best to feed the Empire. But what of our mixed farmers of the East? The men who keep stock and who are of more importance, economically, than the prairie farmers? It seems to be generally forgotten that stockmen are almost all buyers of grain, rather than sellers, and that they have had to buy *after* the rise in price. In other words, one class of farmer sells his grain before the rise in price, and the other class is forced to buy after the rise in price. Who has made the money? Thousands of head of unfinished cattle have been forced upon the markets because their owners could not afford to buy grain to finish them. The same condition was true in the case of swine. With pork at $7.50 per cwt. (the prevailing winter price for "selects" at country points) how much money is there for the man who feeds them with shorts at $1.55 or corn meal at $1.75 per cwt? In figuring on this problem, my city friend, remember that a pound of grain will not make a pound of pork; it requires between four and five. The price of milk and butter remain about the same as last year, but the feeds which the dairyman has to buy have advanced in some cases 50%. With butter at 30c. per pound, the farmer's net return for average milk (including a liberal estimate for the feeding value of the skim milk) will be about $1.60 per cwt., or four cents per quart. At Macdonald College the Live Stock Department estimate (if correctly quoted) that it costs at least $2.00 per cwt. to produce milk — figuring interest on invested capital, labour, feed, etc. . Farmers, as a class, have never received a fair rate of interest on capital invested, with wages for the labour of all members of the family, so they do not figure on these things. What would the manufacturer do in such a case; continue on indefinitely for the good of the Empire, or close down, turn off his men and howl for more protection?

Another point in regard to farming seems to be generally ignored. Does it never occur to town and city people that the farmer, in common with other producers, is subject to the law of diminishing returns? Up to a certain limit, depending of course upon circumstances, cultivation and fertilization may return a profit; beyond that there is loss. In the keeping of livestock the same principle holds true. It may pay a farmer, for instance, to keep ten cows which he can feed largely from the products of his land and care for with the labour of his family; but fifteen cows may mean the hiring of expensive labour and the buying of so much feed that profits disappear altogether. Again, it may pay to feed 15 or 20 pigs, largely with the byproducts of a dairy and home grown grain; but double that number would incur the buying of much feed and might easily result in loss.

We have lazy farmers, we have ignorant farmers, we have shiftless farmers; for they are all human. But, I venture to say, there are many more lazy, incompetent, vicious people in the towns and cities than on the farms. Talk about the sluggishness and torpor of the country! Bosh! There are tens of thousands of earnest, energetic, intelligent men living strenuous lives on the farms of Canada,—not only striving with the forces of nature, but handicapped at every turn by legislation enacted through the influence of organized and privileged interests. The disadvantages of country life are due fundamentally to lack of finance, not lack of brains and energy. If farmers were as prosperous as most town and city people think them to be, our factories would not be able to supply their demands. We would have better schools, better roads, better social advantages, with more of the conveniences and luxuries of city life, for the money would be there to pay for these things.

C. S. MOORE

(NOTE.—Professor Barton, head of the Live Stock Department of Macdonald College, declines to assume responsibility that "it costs *at least* $2.00 per cwt. to produce milk". Under some winter conditions it does actually cost over $2.00, but under conditions, and specially in the summer, milk can be produced more economically. This slight amendment of Mr. Moore's quotation does not, of course, affect the general validity of his contentions.—Ed.)

LIQUID MANURES FOR FARM CROPS

THE fertilizing value of liquid manures is appreciated to a much greater extent nowadays than it used to be. Farmers and gardeners are usually quick to recognize its importance, and all kinds of appliances have been devised to conserve it and distribute it for the benefit of crops. Plenty of natural liquid manure is produced on the average farm. The cattle, horses, sheep, and pigs all add to the supply. Generally, however, this valuable and very rich fertilizing material has been, and is now in some cases, allowed to drain away into the ditches around the yard. Very feeble attempts have been made to preserve it undiluted by rain or exposure to the elements. Latterly, however, I have noticed that many progressive farmers have sunk tanks in the ground, or have dug clay-lined pits, for the purpose of storing this liquid manure. Pumps have been put in, and every facility has been given to the careful storage and economical distribution of this valuable product.

The liquid manure produced in the farmyard should be carefully collected and stored, not only because it is a valuable fertilizing material, but also because of sanitary reasons. I have seen many dung-yards where the floor or ground was quite porous, so that all the liquid drainings from the byres and stables were quickly lost. To remedy this, one should remake the floor with a well-beaten layer of clay, and, as a further safeguard, a good covering of rubble should be placed on top. A cement or concrete floor is naturally the best of all, but it is rather expensive. Do not forget that the floor should always have a decided slope toward the centre of the yard and away from the byre itself. If a tank or pit is to be put in for the purpose of storing liquid manure it should always be situated at the back of the cowhouses or stables, and at least seven or eight yards away from them. Flagged drains must be laid between the pit and the buildings, and the former should, of course, be large enough to accommodate the liquid drainings from all of the live stock on the farm.

What is liquid manure ? As ordinarily understood, it consists solely of the liquid excrement voided by cattle and horses and other stock. Commonly it is known as urine and it has been demonstrated that the urine of a cow is richer and more valuable as plant food, weight for weight, than the solid excretra or dung which is mixed with the straw and litter or bedding material that is used in the cowsheds. Cows produce "liquid manure" which, on the average contains 0.8 percent of nitrogen, 0.7 percent of phosphoric acid, and 0.6 percent of potash. The urine of the horse and sheep is somewhat richer in nitrogen and about the same in potash, while that of the pig is richer in phosphoric acid but poorer in nitrogen and potash. The nitrogen in liquid manure is very active and most easily "available". It is however, very easily lost, owing to a process of fermentation, which causes the urea of the liquid to change into ammonium carbonate, which is a volatile substance. If gypsum or superphosphate is sprinkled in the urine however, this loss of nitrogen will not take place so easily.

The liquid excrement from any animal consists chiefly of that part of the food which has been digested, but which has not been retained in the body. Nitrogenous foods are a most important part of the diet of cows and horses. Generally these nitrogenous constituents are grouped under the term "albuminoids," and the organic nitrogen which is at once the most costly and the most important manurial ingredient in these nitrogenous foods is passed from the animal's body to a greater extent in the urine than in the solid excrement.

The value of liquid manure as a rich fertilizing medium can be very easily appreciated by anyone who has taken the trouble to study the root growth or habit of plants. It will have been demonstrated that the extremities of the roots always strike downwards into the subsoil below in search of the three essential forms of plant food nitrogen, phosphoric acid and potash. These different constituents are usually present in the soil in a liquid form, and therefore it is clear that liquid manure of any kind must be a very desirable form of nourishment for growing plants, particularly in soils that are comparatively poor in nitrogen—the most costly of all the three "essentials." The great drawback is that there is so very little phosphoric acid in liquid manure. And besides this, there is admittedly a serious and very rapid loss of nitrogen as soon as liquid manure is exposed to the air.

In addition to the ordinary drainings from cowsheds and stables, liquid manure can easily be made by steeping certain fertilizing agents such as nitrate of soda, sulphate of soda, or guano in water. No more than half a pound of either of these agents should be used with twelve gallons of water. Another very valuable form of liquid manure is that known as soot water. It may be made by steeping a bag containing about six quarts of soot in a hogshead of rain water.

Perhaps the most powerful and concentrated form of liquid manure is that known as sewage liquid, but gardeners and farmers had better give this a wide berth unless there is some convenience for properly diluting it before use. In any case, always apply liquid manure after a shower of rain, otherwise it is apt to scorch the plants if the soil is dry and parched. Also, never use at mid-day, but only in the morning and evening. For fruit trees, apply liquid manure in week dressings, only after the fruit is properly set, and not before. This manure will usually prove of considerable assistance in helping the fruit to swell. Peaches and nectarines seem to derive more benefit from dressings of liquid manures than any other fruit trees. Soot water is good for all garden crops, especially green crops.

CLEANING AND GRADING SEED GRAIN AND FLAX

THE 1913 Seed Branch inquiry into the condition of seed grain used in Canada showed that an average of 44 noxious and 138 common weed seeds were being seeded on each square rod of land in oats. Seed wheat and barley were equally foul and flax was about four times worse. Over 88 per cent of the 2065 samples of wheat, oats, barley and flax collected as being sown were reported cleaned with a fanning mill, but most of the samples showed that either the mills were not equipped with the proper sieves or else they were not well operated. The remaining home-grown seed, almost 11 per cent, was being sown direct from the thresher with no cleaning whatever. Small, broken and shrunken seed in the samples also indicated the failure in grading.

Cereal grains should be graded to remove from one-third to one-half of the total bulk, and most of the weed seeds will be removed with the screenings. Some of the weed seeds are difficult to separate but most of them can be removed by a fanning mill. Any make of mill which has sufficient shake, angle or slope of sieves and wind supply may be provided with suitable sieves. The top sieves should be just coarse enough to let the grain run through and need sufficient slope to run coarse impurities over the tail of the mill. The lower screens should have openings of the size required for grading or removing weed seeds.

With wheat the grade for high-class seed is made over an 8-64 inch perforated zinc screen. The grade for oats is made over a screen with slots 5-64 by ½ inch. Barley requires the same type with slots larger depending on the size of the seed. Wild buckwheat may be removed from wheat by a screen with triangular perforations 9-64 inch or larger. Flax requires on top a woven wire sieve 3 x 16 inch mesh (3 spaces to the inch one way and 16 the other) and a 1-12 inch perforated screen below.

If sieves or screens of the desired size and type cannot be had from the fanning mill manufacturer, the sheet material may be obtained through any reliable seed house and made up by a carpenter.

Seed Branch, Ottawa.

METHODS AND RATES OF PLANTING CORN

THE row or drill method of planting corn is still commonly followed in Ontario and Quebec. The investigation conducted by the Seed Branch shows that 956 farmers were planting in drills at an average rate of 2.14 pecks of seed per acre and 350 planted in squares or hills at 1.17 pecks of seeds per acre. The average results of thirty-two separate tests conducted throughout Ontario for a five year period shows that the hill method gave one ton of green crop per acre more than the drills, and three eighths of this ton was in the form of freshly-husked ears. A four year average at the Experimental Farm, Ottawa, shows two and three-quarter tons per acre in favor of the hill method. Hills should be three feet apart each way and contain three or four plants. Rows should be three feet apart and the plants nine inches apart in the row. Three and a half feet spacing might be preferable for large growing varieties or weedy land. The hill method gives a much better opportunity for cultivating the land and controlling weeds, but the corn is rather more difficult to harvest than that which is grown in drills.

One bushel, 70 lbs. on the ear or 56 lbs. of shelled corn, germinating 95 per cent, should be sufficient to plant five acres by the hill method. One acre will require 60 cents worth of seed @ $3.00 per bus. Seed corn of the same price planted at the average rate by the drill method will cost $1.60 per acre.

SEED BRANCH, Ottawa

QUEBEC SEED GROWERS' CO-OPERATIVE ASSOCIATION

Ste. Rosalie Junction, Bagot County

Mr. Clement Lussier, Président, Ste-Rosalie,
Mr. Horace Morin, Vice-President, St. Hyacinthe.
Mr. J.E. Lafontaine, Director, St. Hughes,
Mr. Arsène Denis, Director, St. Norbert.
Mr. Joseph Descoteaux, Director, Ste. Monique.
Mr. O. E. Dalaire, Secretary, St. Hyacinthe.
Mr. Ovila Roberge, Treasurer, Ste. Rosalie Jct.
Mr. Louis Lavallée, Manager, Ste. Rosalie Jct.

THIS Society was formed by virtue of the Act concerning Co-operative Agricultural Societies, by notice signed by the Hon. J. Edward Caron, Minister of Agriculture, and published in the Official Gazette of Quebec on December 5th 1914. (See also the public notice of December 12th 1914 regarding the name of the society).

Its object is principally to assist seed-growers. Its chief place of business is at Ste. Rosalie, Bagot county, where it has a large three-storey elevator, with the most improved machinery for the selection and cleaning of seed. There is also a mill to grind grain which is unfit for seeding purposes, in order to prevent the propagation of bad weeds. We specially invite farmers to visit this warehouse, asking them not to disturb the workmen in their work. They are equally interested in this work being as productive and remunerative as possible. Visitors will note how perfectly the seed is cleaned, and notably clover seed. They will find sorters from the best known houses of Belgium and the United States. These machines are driven by a gasoline motor. Farmers are able to clean their seed there and those who own shares in the capital of the Society, for one hundred dollars, pay less for this work than do farmers who are not members of the Society; this regulation is only just.

This Society has sufficient capital for the needs of the moment; but the greater the funds at its disposal, the greater benefit will it be to the farming community.

Nothing has been neglected to assure the success of the undertaking, and to furnish to farmers seed grain remarkable for its vitality, purity and yield.

Experts will visit during the summer the fields of the members who intend selling to the Society in order to ascertain whether the standing crop is pure and free from weeds. Their reports will serve to guide the Society in its purchases. The fields thus inspected will only be established on the farms of members of the Society, to whom, when making purchases, the Society will give the preference, all things being equal as to price and quality. The Society will pay remunerative prices for good seed grain, but it will not be deceived, neither will it deceive its members, whom it desires to serve honestly. If such a thing happens, it would be on account of the incompetence and indifference of its employees, and such employees would not remain in its service if they do not show themselves loyal to their duties.

In order to improve conditions for seed-growers and to increase farm production, agricultural societies and circles are invited to subscribe to the capital of the Society, but it goes without saying that their members are not by so doing made members of our association.

SEED GRAIN FOR SALE

The society has bought a certain quantity of registered seed, grown by members of the Canadian Seed Growers' Association. This seed is of first quality, and we invite our members to buy it. We have for sale also the following seed : — Corn, oats, barley, peas, buckwheat, clover, millet.

All farmers who are interested in the success of our enterprise are invited to subscribe to the capital of the Society. In this way the greatest service can be rendered to the rural population.

A member subscribing one hundred dollars will pay ten dollars a year until the complete payment is made.

THE DIRECTORS

Ste. Rosalie, April 3rd., 1915.

DRINKING WATER

IN the spring it is difficult, often impossible, to obtain pure drinking water from natural sources. This state of affairs is very serious for on the farm no special treatment is given to drinking water and very few farmers realize that in the spring their usual drinking water may contain numerous dangerous bacteria.

During the winter large quantities of refuse matter accumulate on the surface of the frozen soil and the spring thaw washes this material into brooks and rivers. Analyses made of water during the spring thaw show a tremendous increase in bacteria in general and especially *colon bacilli.* The *colon bacillus* is the principal representative of a group of harmful organisms and when it appears in drinking water in large numbers intestinal disturbance will soon follow.

At Macdonald College the Ottawa river water is sampled regularly and the increase of colon bacilli during the spring rise has been very much in evidence, corresponding with serious epidemics in Montreal and villages situated along the river bank. Lately the water in Montreal has been treated for bacteria and the spring epidemics have become less notorious.

The following table gives colon bacilli in the Ottawa river per 100 c. c. water.

January	20
February	10
March	10
1st week April	400
2nd " "	800
3rd " "	1100

Health officers do not allow more than one colon bacillus per 100 c. c. water.

Rivers flowing through less populated districts will show better conditions; for example the St. Maurice river contains no colon bacilli in midwinter, only one per 100 c. c. water in March, and about 20 during the spring thaw. Here we have reliable drinking water except during the thaw.

Numerous farms are supplied by means of wells and when these are well constructed and go to a sufficient depth spring contamination is not probable. Unluckily very few wells can pass the test. A careful investigation of hundreds of wells has shown that many are too shallow and that not only contamination enters in the spring, but also after every heavy rainfall. Further many wells are poorly constructed and surface water gets in during the spring thaw.

Only a careful investigation can prove the quality of the water obtained and in the meantime we advise strongly the boiling of all drinking water during the spring.

The dangerous bacteria found in water do not resist heat very well, and it is sufficient to bring the water to the boil and allow it to cool slowly.

J. VANDERLECK.

CLOVER AND GRASS SEEDS

Clover Seed Situation

THE United States imported 38,551,137 lbs. of clover seed valued at $6,099,136 for the year ended June 30, 1912 and exported only 1,874,682 lbs. This gives an adverse balance of 36,676,455 lbs. Imports from Germany to the United States, amounting to 7,842,273, lbs. for the calendar year 1912, will have to be obtained elsewhere. 7,116,060 lbs. of clover seed were exported from Canada during the past fiscal year, 5,187,480 lbs. of which went to the United States. This quantity should be largely increased next year, hence the advisability of a large increase in the acreage of the red clover seed crop in Canada.

Kentucky Blue Grass

The remarkably low price of Kentucky Blue Grass seed this year calls for a special consideration of the characteristics and value of this grass. It is a long-lived perennial with creeping rootstocks but is rather slow in getting established. It will live under the most trying conditions but does best on a moist fertile soil which is rich in lime. Growth starts early in the spring and the plants flower about the same time as Orchard Grass and Early Red Clover. It should be grown in mixtures for hay on a long rotation or for permanent pasture and is the basis of lawn mixtures. It is an excellent bottom grass and is much relished by stock. The legal weight of seed is 14 lbs. per bus. and the minimum legal germination is 53 per cent.

SEED BRANCH, OTTAWA.

FARM LABOR AND WEEDS

Outlook for Farming

SPEAKING before the Experimental Farm Superintendents recently assembled in convention at Ottawa, Mr. Geo. H. Clark, Dominion Seed Commissioner, sounded a note which is of special interest at the present crisis in Canadian agricultural. In prefacing his address he said : "Unfortunately farming during the last ten years or more has been less attractive to young men of good ability and to capital than other industries in urban centres. The problem of farm labor has been an exceedingly perplexing one and in consequence farm systems have been modified so as to require the minimum of labor for the maximum yield of net returns. City industries have completely outbid the farm in the matter of labor, and it is probably true that at least one-third of city working men have had experience in farming. I would like to say to those men now that if the opportunities in the city looked brighter during the past ten years, the next ten years, in my judgement, assuredly belong to the farm, and the sooner they realize that the better for themselves and for all concerned."

The Effect of Meadow weeds

Weeds growing in hay crops may actually increase the tonnage of cured hay. But if farmers had parts of plants of wormseed mustard, false flax, shepherd's purse, mayweed, etc., finely ground and mixed with their porridge, they would better appreciate why dairy cows or horses toss weedy hay out of their mangers. Some inconsiderate farmers chop weedy hay in a cutting box thus preventing their stock from picking it over and avoiding the weeds. They do not seem to realize that many such weeds are unwholesome or even poisonous and that when forced to eat them animals fail to make gains, or yield a small quantity of badly-flavored milk and become generally unthrifty. If forced to eat such feed they will consume only sufficient for their existence. The most economical gains are obtained from feeds which are not only highly nutritious from a chemical standpoint but are also relished by the stock. This is a condensed item from the introduction to "Fod-

LIVE STOCK

A PROFITABLE TYPE OF MILCH-COW

THIS illustration represents the young Holstein cow Norine 12777. She was bred by Neil Sangster, Ormstown, Que. and raised at Macdonald College, Que.

Norine freshened for the first time when she was just three years old, making a record of 9,681 lbs. of milk and 353.1 lbs. of butter in eleven months. The cost of her feed for the twelve months, including one month dry, was $63.51, and the value of her milk at eighteen cents per gallon, the average yearly price paid for milk shipped to Montreal, would equal $174.25, making a profit of $110.74.

Norine freshened for the second time at approximately fourteen months after her first freshening and made a record of 11,773½ lbs. of milk and 373.1 lbs. of butter in nine and one half months. The cost of her feed for twelve months, including two and one half months dry, was $72.65, and the value of her milk at eighteen cents per gallon would equal $211.92, making a profit of $139.27.

This young cow freshened for her third time in January, exactly twelve months after her second freshening, and during the short month of February she gave 2022¾ lbs. of milk.

The outstanding feature in this particular instance is not this cow's record, because it is not of such proportions that one could call it phenomenal, especially in view of the numerous twenty and the occasional thirty thousand pound cows that are appearing at the present time. Nevertheless the importance of regular breeding and regular annual production from the standpoint of profit—and that should be the ultimate aim of the breeder—are features strongly illustrated by this cow as well as many other cows from the same herd.

---

der and Pasture Plants" copies of which may be procured by Canadian Farmers from the Government Printing Bureau, Ottawa, for the nominal price, 50c. This book has twenty-five full-page illustrations showing the principal grasses and clovers in their natural colors.

SEED BRANCH, OTTAWA

FIELD ROOT AND VEGETABLE SEED SITUATION

FOR three months after the outbreak of war much anxiety was felt throughout North America as to supplies of field root and vegetable seeds that come principally from the warring countries of Europe. The field officers of the Seed Branch devoted much of this time to a study of the possibilities of creating a supply of Canadian grown seed for 1916 planting. It was advisable in the autumn to select and specially store any biennial roots to be transplanted this spring for seed production.

Fortunately the European seed crop of 1913 was much above the average for practically all kinds. Owing to previous shortage in supplies most Canadian seed houses had increased their orders by 50 per cent or more and had received full delivery. The excellent seed crop of 1914 was also harvested in spite of war conditions and, although deliveries have been delayed and transportation excessive, most seed houses have received the greater part if not all of their contract orders. Canadian seed houses of good financial standing are thus in a position to carry over sufficient supplies to meet a very considerable part of 1916 requirements.

The quantity of field root and vegetable seeds that may be produced in Europe during the present year or the next is highly speculative. This work requires much skilled labor of which there must be a marked shortage for agricultural purposes. European Government direction of increased food production and relatively high prices for food crops will doubtless decrease the areas devoted to these seed crops and to stock seed roots which would normally be grown this year for transplanting in 1916.

Canadian farmers and gardeners should give this unstable situation their serious consideration. The soil and climate conditions in different parts of Canada are equally favorable if not superior to those of Europe. The growing of these seeds in quantity for commerce has been limited in Canada by the higher price of labor and because few farmers had experience with biennial seed crops. A few dozen or a few hundred sound shapely roots set out this spring may give valuable experience, which may be much needed, as well as some good seed. A bulletin on field root and vegetable seed production may be had on application to the Publications Branch, Ottawa.

Seed Branch, Ottawa

FOR SALE

Belgian Stallion imp. by (B. Beaulieu) Baron de Bacht imp., 66 (Vol. 16, page 1233). Eight years old. Weight 1800 in fair flesh, color chesnut, light tail and mane. Reason for selling, have had him there years and require a change. His stock is of the best. For price and any other information apply to H. H. CLEVELAND, Danville, Que.

SHEEP HUSBANDRY

UNDER the title of "The Great Neglect in Sheep Husbandry", which constitutes Pamphlet No. 9 of the Sheep and Goat Division of the Dominion Department of Agriculture, Messrs. T. Reg. Arkell and Norman Stansfield, two well-recognized authorities, explain the necessity for the early castration of ram lambs intended for slaughter and the value of docking in the maintenance of health. They consider that both these operations are beneficial and cannot see that, while they are practised in other animals, there should be any hesitancy in performing them on sheep. Ram lambs treated develop in flesh and command a better price in the market, while female lambs being docked escape disease and insect pests by reason of increased cleanliness. Illustrations are given of the methods employed and advice furnished of the desirable age and the advantages that accrue. Farmers would be serving their own interest by sending to the Publications Branch, Department of Agriculture, Ottawa, for the Pamphlet.

SHEEP BREEDERS' AND WOOL GROWERS' ASSOCIATION

Farmers of Sherbrooke County Cooperate

MR. A. A. MacMillan, B.S.A., addressed a meeting of the Sheep breeders of Sherbrooke County on Wednesday evening, March 24th, at Lennoxville, on "The Cooperative Marketing of Wool". The discussion which followed resulted in the formation of an Association to be known as the "Sherbrooke County Sheep Breeders' and Wool Growers' Association". The officers of the Association were appointed:— President, A. F. Ward; Vice-Pres., Jas. Woodward; Sec.-Treas., W. G. MacDougall; and for directors:— N. Dean, I. J. Parnell, W. P. Berwick, W. M. Ford, Ed. Hammond and Guy Carr.

The main objects of the above association are:— firstly, the Cooperative Marketing of the Wool; secondly, the purchasing and exchanging of registered breeding sires; and thirdly, the marketing of the lambs.

Sherbrooke County is one of the smaller Coun-

A breedy looking cow of the working kind, Norine 12777, stands in the Holstein row in the Macdonald College herd.

ties of the Province, but for its size the number of sheep kept compares most favorably with any county in the Province, so there is a splendid opportunity for a Sheep Breeders' Association. Special wool sacks have already been distributed to many of the farmers. Demonstrations will be given in the various sections on the proper methods of rolling and tying up the fleeces for market. All the wool will be brought to Lennoxville, and graded and sold according to the grade as soon as the grading is completed. Graded wool last season brought from three to five cents more a pound than ungraded wool. Cooperation has proven a success in others parts, and the directors of this association feel that this is a step in the right direction.

W. G. M.

SPRING MANAGEMENT OF BREEDING EWES

LAMBING time is at hand. Fall and winter management are important but if the breeding flock is to be carried through to a successful issue the skill and watchfullness of the shepherd must not be relaxed during the spring months.

FEEDING.—

The ewes now have to provide for the growth of the young lambs as well as maintain their own bodies. Consequently they require a highly nutritive ration. Ewes that have not been receiving grain during the winter should now receive a liberal allowance at least for one month to six weeks previous to lambing. Oats and bran in the proportion of two of oats to one of bran make an excellent grain ration. Ewes that are thin in condition may have a little oil-cake added. A few roots are also relished by the ewes although they must be used judiciously as excess leads to overdevelopment of the lambs and a lack of vitality. Clover or alfalfa hay is the best roughage for sheep. These, however, are not available on many farms, timothy being used quite extensively. Where timothy is fed grain-feeding should commence sooner as the ewes cannot maintain the same condition on timothy owing to the fact that it contains little nitrogenous material. The flock should be supplied with abundance of fresh water and salted regularly.

PROVIDE COMFORTABLE QUARTERS AND AVOID DISTURBANCE.—

The ewes should be made as comfortable as possible. Any unevenness in the pens should be leveled and a liberal supply of bedding provided. All doors and gates should be kept wide open during the day time thus enabling the ewes to pass in and out of their pens without danger of getting jammed or hurt. The presence of dogs, strangers or anything that will frighten the ewes should be avoided if possible. The attendant should endeavor in every way to gain the confidence of the ewes so that his presence causes no excitement.

PREPARATION FOR LAMBING.—

Sheep drop their lambs at from 142 to 145 days after being bred. Farmers as a rule keep little or no record of the breeding dates of the ewes in their flock, and neglect in this respect is responsible for a large proportion of the loss of lambs which occurs in the spring. If the date on which the ram was turned with the flock were known and if the breeding of the ewes were watched more closely little difficulty would be experienced in ascertaining probable dates on which lambs would be dropped. Not infrequently one or more ewes are bred through accident earlier than was anticipated and such ewes invariably lose their lambs through exposure. All flocks should be examined once or twice before lambing is expected to commence. Every ewe that is found to be well advanced to the lambing should be carefully watched and if necessary removed to a separate pen.

CARE AT LAMBING TIME.—

If the ewes are all bred to lamb during the warm weather little difficulty will be experienced. The attendant should keep a careful watch over the flock. Any ewes that have difficulty in lambing should be assisted. Weak lambs need assistance and care must be taken that they do not become chilled. A teaspoonful of brandy in a little of the ewes milk will often revive a lamb that has become chilled. Ewes that are expected to lamb during the cold weather should be provided with warm quarters. Where only a few early lambs are raised a part of the stable may be closed off for the ewes. Ewes that lamb early require liberal feeding on nitrogenous foods to stimulate the milk flow. Mangels or turnips, if available, should be fed in liberal quantities. The meal ration may consist of two parts of oats, one part of bran and one half to one part of oil cake. Ewes depending on their size will consume from four to six pounds of roots, one and a half to two pounds of grain and one and a half to two pounds of hay per day. At two or three weeks of age the lambs will begin to eat grain and should be encouraged to take all they will eat. Equal parts of whole oats, bran and oil cake makes a good ration for the youngsters. Early lambs are often the most profitable especially if they can be developed sufficiently well for sale during June or July.

DOCKING AND CASTRATION.—

All lambs should be docked and the males, not intended for breeding purposes, should be castrated. Docked lambs are much neater in appearance, more attractive to buyers, more easily kept clean and more suitable for winter feeding. Ewe lambs intended for breeding are much more satisfactory when docked. Many farmers follow the practice of docking their ewe lambs and leaving the wether lambs. Flocks so handled lack uniformity in appearance. Wether lambs may be easily distinguished by placing a mark in the ear.

Uncastrated lambs are a source of annoyance in the fall. They require to be separated from the ewe flock, and being more excitable do not make such good gains.

Docking should be performed when lambs are ten days to two weeks of age. A good knife is the only instrument required. The knife and hands of the operator should be clean and the use of a disinfectant is advisable. An assistant should hold the lamb at the proper height and with the legs held tightly towards the body. The tail should be severed with one downward stroke of the knife leaving a stub one and a half to two inches long. After docking the lambs should be watched to see that none are likely to bleed to death. Should bleeding not stop a string may be tied around the tail until the blood clots, after which it should be removed.

A few days should elapse between docking and castrating although many farmers find it most convenient to perform both operations at once, and with strong lambs of the proper age no serious results are likely to follow. In castrating the operator grasps the scrotum with the left hand pulling it well free from the body and with a downward stroke of the knife severs the top third completely. The testicles will now protrude and may be slit at the constriction near the top when they will spring free and may be severed from the body by pulling until the cord breaks. Many farmers make the mistake of removing the testicles through a small opening on either side or end of the scrotum. This method does not allow of sufficient drainage and the wound is likely to heal too quickly causing festering.

A. A. MACMILLAN,

Macdonald College

AYRSHIRES SELL WELL AT "SPRINGBURN"

THE dispersion sale of Ayrshires of Messrs. McMillan & Leggat, at "Springburn" Farm, Trout River, Que. on April 2nd, 1915, drew a large crowd. Bidding was keen and the 54 head brought under the hammer, were disposed of in about two hours, by the noted live stock auctioneer, A. Philps, M. L. A. of Huntingdon, Que.

The sale realized $9458.00, being an average of $175.15 a head. This may be termed a good average, considering that sixteen of the offerings were under nine months, and five of these were less than one week old.

Prominent Ayrshire breeders present were L. J. Tarte, (Editor of La Patrie) Montreal; C. J. Ebby & Sons, Cherry Creek, N. Y.; Geo. H. Dunsmore, And. Collum, and Owen Collum, St.Albans, Vt.; J. H. Black and Alex. Doig, Lachute, Que.; Hugh J. Chisholm, and John Livingstone, Port Chester, N. Y.; John Will, Fort Covington, N. Y.; A. R. Ness, Macdonald College, Que.; Prof. Cooley, Experimental Station, R. I.; Rev. Hugh Macpherson, Antigonish, N. S.: James Bryson, Brysonville, Que.: Robert Ness, R. R. Ness, D. T. Ness, J. A. Logan and Hector Gordon, Howick, Que.; J. P. Cavers, Ormstown, Que.; Malcolm Cummings, Lancaster, Ont.; besides many others.

The Springburn Herd was started in 1879 by the late James Stephen and carried on by him and his sons for many years. Finally it succesded to his sons, W. F. and J. A., and later W. F. Stephen, secretary of the Canadian Ayrshire Breeders Association, became the owner. During those years it was known as the Brookhill and Springbrook herds, and was noted for animals of good type and large production. On Aug. 1st, 1911, the farm and herd were taken over by Messrs. McMillan & Leggat who altered the name to "Springburn". During the three and one half years under the present proprietors new blood had been added and the herd had continued to improve.

Messrs. McMillan & Leggat have now dissolved partnership and the sale was held in order to enable them to divide the assets of the firm. The herd was in fine condition and had been under government supervision in the tuberculin test for the past four months with the result that a clean bill of health was granted. This allowed any individuals from the herd to enter the United States, and had it not been for the strict embargo in New York State on account of foot and mouth disease, more buyers would have been present from over the border. The day preceding the sale, a permit was received from the authorities of that State to allow individuals from the herd to enter, but this was too late to allow more than a few prospective purchasers to attend. Mr. Will made purchases for a firm near Buffalo. He and the Rev. Hugh Macpherson were the heaviest purchasers, the latter buying for farmers in Antigonish County, Nova Scotia. Considerable interest was centered in the sale of "Kirkcarswell Nicky 5th (Imp) -39395- (31665) . Messrs. R. R. Ness, Chisholm and Tarte each wanted her and the latter became the proud owner for $800.00. For the Grand Champion show cow, Auchenbrain Hattie 6th- (Imp) -39380- (23295) the bidding was most spirited by the same parties. This time Ness won out at $700. This cow has a milk record in Scotland of 9103 lbs. milk testing 4. 1 per cent butter fat. Other aged cows selling for good prices were Rose of Harley-30889 to J. P. Cavers, Ormstown, $380; Springhill White Lady-33417- to Nathan Douglas, Chateauguay, N. Y., $345; Maple Forest Lucky Girl-35904- to Malcolm Cummings, Lancaster, Ont., $525; Lauretta- 36129-to A. J. Ness, Howick, $300; Bonny Ruby-36132-and Julia-36488- to John Will, Fort Covington, N.Y., $250 and $225; and Little Gem 2nd-38118-, Beautiful Maid-34473 , and Tibbie of Maple Forest-36130-to Rev. Hugh Macpherson, Antigonish, N.S., $285, $245 and $235.

For the younger offerings there was some spirited bidding. Robert Holmes of Howick bought the two year old Springburn Violet-41628-at $230. John Will of Fort Covington, N. Y. bought three two-year olds and three yearlings at an aggregate of $920. R. M. Howden of St. Louis Station paid the handsome price of $165 for a 9 months', and D. T. Ness $127.50 for an eight months' heifer calf; while R. R. Ness paid $100 for a calf just one week old and Jas. W. Arnold of Dundee $60 for one three days of age.

The imported bull Springburn Royal Ensign-36065-went to Rev. Hugh Macpherson, who also bought a bull calf at $100. Hector Gordon bought the yearling bull, Gay Lad of Ayrmont-42691-at $120 and R. R. Ness took two bull calves at $135 and $150.

SEASONABLE HINTS

THERE has been issued by the Department of Agriculture through the branch of the Experimental Farms, a brief pamphlet containing seasonable hints for the information of stock raisers, grain growers, bee-keepers, poultry raisers and gardeners. While it contains only 12 pages, it is replete with suggestions and recommendations made in the hope that some of them at least will be helpful to each and every reader who secures a copy. Practically all of the suggestions made and recommendations given, tend towards the increasing of production or the lowering of the cost of the articles produced.

Copies of this pamphlet are being sent to those whose names are on the mailing list of the Department of Agriculture, but the pamphlet is also available to others who make application to the Publications Branch of the Department of Agriculture, Ottawa.

EXPERIMENTAL FARMS REPORT

THE work and scope of the Experimental Farms and Stations have developed to such an extent that it has been found necessary for the sake of convenience to devote two volumes of nearly five hundred pages each to the main or aggregate report for the year ending March 31, 1914. In the first volume is presented the reports of the Director and the Divisions of Chemistry, Field Husbandry and Animal Husbandry. It is by a study of these chronicles that an idea can be obtained of the vast amount of work that is being done and an appreciation arrived at of a resultant good.

In the first few pages are given the usual comparative tables of grain yields and prices and of live stock for the five years extending from 1909 to 1913, each of which, excepting horses and swine, show a decrease in the Eastern Provinces since 1910. In the Western Provinces there was a deficiency of upwards of 300,000 cattle between the same year and 1913, but an increase of nearly half a million horses and only a slight disparity in sheep, which, however, are showing a tendency to improvement. Swine increased by upwards of 500,000. In British Columbia the numerical changes were comparatively light. Naturally much space is given to reports of experiments at the different farms and stations. These experiments, it is hardly necessary to say, cover every variety of grain, fruit and vegetable production, as well as soil development, crop management, cultivation of forage plants and grasses, live stock breeding and dairying. It would be impossible to overestimate the importance of the information thus furnished.

Of course at this time when the value of increase by improvement of production is being strenuously urged the reports are of special interest. It is not alone with what may be termed activities of the farm proper that they deal but also with building, with clearing, with roadmaking, with ornamental gardening. In short, the reports constitute virtually an encyclopedia of farming and its branches brought up to date.

While, as has been said, Volume I is devoted to the review by the Director and reports of the Divisions of Chemistry, Field Husbandry and Animal Husbandry, Volume II presents the reports of the Divisions of Horticulture, Cereals, Botany, Entomology, Forage Plants, Poultry and Tobacco. All that has been said of the completeness in its contents of the first volume can be repeated of the second. It, too, is a usefull compilation and a sample in detail of the benefits to be derived from scientific and painstaking research.

As in the preceding years, the matters dealt with in this volume are divided into sections, (a) Giving precise information of the work at the Experimental Farms in the Divisions referred to, and (b) Treating of the various lines of experimental work under way throughout the system. It is explained that the latter section is devised and designed with a view to aiding the farmer more directly in the details of his vocation. It is worthy of wide distribution. One thing certain is that the nature of the reports makes them deserving of the closest attention. Copies may be obtained by making application to the Publications Branch, Department of Agriculture, Ottawa.

WHEN IS HOG RAISING PROFITABLE ?

When it is done as a side-line and the by-products of the farm can be utilized

(Portion of an address by Prof. E. Day, at the Winter Fair, Guelph)

I was talking to a prominent stock breeder the day before yesterday who has a large herd of pure-bred cattle, a large flock of sheep, and some hogs, and he said to me, "I hate pigs. The only time I like pigs is when I am fixing the tail board on the wagon and they are going to the market." I asked him how many he kept, and he said: "Two or three breeding sows." I also asked him why he kept them. "Well," he said, "It is just like this. I find there is a lot of stuff around my farm that does not seem to fit in for anything except pigs. The pigs will utilize the slops from the house and refuse grain, and they will glean the stubbles. There is a lot of stuff that I would not get any return for if I did not have pigs, and that is why I keep them".

Right there is where I think the secret of profitable pig raising rests. I have had a good many men approach me with regard to the pig business, wanting to know the best way of going at it on a large scale. Just a few days ago a gentleman came up from Toronto to talk over with me the possiblities of using several thousand acres of Western land in raising pigs, and the profits he would make therefrom. My reply to a question of this kind is that the profits would likely be extremely small, because it all depends on the management given to the herds. Where a farmer has a few pigs that he is looking after himself, he is always on the alert to forestall disaster, and he escapes a great many difficulties that he would not escape if he were in the business on a large scale.

Hog Raising a difficult business

There is only about one man in ten thousand who is able to take hold of a big pig feeding proposition and make it go. We have a few men (like Mr. Brethour, for instance, who is present this afternoon) who can do that sort of thing, but men of his stamp are mighty scarce.

Some few years ago, a concern east of Toronto started in the pig business and they expected to make a fortune out of pigs. They had read that a pig would make a pound of gain on so many pounds of grain, and at the prevailing price of grain at that time they would make large profits. They went into the business on a large scale and they put up expensive buildings. After a few years of disaster they said: "That fool of a Day at the College said that pork could be produced at 5c a pound, but we have demonstrated that it costs 14c a pound". Of course they had. I do not doubt it at all because it all depends on how things are handled, and it is easy to lose money on pigs if you go at it the right way to do so.

The gentleman I told you about at the commencement of my address keeps two or three breeding sows although he dislikes pigs. He says he feels that the money which comes in from the pigs is largely found money. It is money that he would not have or be able to get in any other way. If he loaded his farm up with pigs he probably would not make so much money out of them, and he might possibly show a loss. It is in working off the by-products of the farm that you make the greatest profit. You are able to utilize a great many things that otherwise would be wasted.

In the large cattle feeding States, where corn is grown, we find hogs following the steer to utilize the corn that is thrown out of the manger and the corn that is not digested by the steer. On the dairy farm, we find hogs utilizing the dairy by-products, and on the general farm we find them gleaning the stubble fields and making a little money for their owner in that way, as well as utilizing a great many other things that would otherwise have been thrown away. Even the cottager often keeps a pig to utilize the material from the kitchen that would otherwise be wasted, and it is along these and similar lines that the hog works in to best advantage. I believe, as in the case of sheep, pointed out by Mr. Harding, there is a place for a few pigs on every farm, provided the owner of the farm knows just how many pigs his farm will carry to advantage.

Use Common Sense

I do not believe the plunger is going to make money out of pigs. We have too many plungers in this country. I do not know whether there is something wrong with their heart action, but a great many farmers in this country get cold feet on the slightest provocation. Pigs were up to 10c a pound and the farmers were climbing over one another to buy pigs at a high price. The price went as low as 7c, and these same people began to say, "Oh, bother the pigs." We used to think that 7c was a big price. A few years ago, 7c looked like something that was impossible, and when people talked about pork going to 7c live weight we thought they were too optimistic, but now we are turning up our noses at 7c.

Look back and size up the situation and see who have been making money out of live stock. They are not the men who jump into some particular class of live stock because the price is high and then throw it on the market when the price goes down. The men who are making money are the men who have stuck to certain lines of stock and made them as good as they could. When prices are high, they can afford to take advantage of the market; and when the price goes down they are not overloaded with stock. Even with prices for stock at their worst, they are better situated than the man who sells his grain on the market. I claim that the successful handling of stock is the line along which a farmer will make the most money in the long run.

Hogs lend themselves to the plunger a little more readily than other lines of stock, because they come into breeding so quickly and they are so easily unloaded, and we find the supply going up and down more rapidly than in the case of almost any other class of stock; but I cannot understand why a man should throw over all his hogs when the price goes down a little. If we look back we can easily see that although prices have gone down in the past they have always come up

THE DAIRY

PROGRESS IN CO-OPERATION

THE number of co-operative associations in the Province is increasing very rapidly.

The Quebec Cheesemakers' Co-operative Association is more prosperous than ever, and contributes largely to the improvement of our dairy products. At the last butter competition at the Toronto Exhibition, out of 24 prizes, 20 were obtained by members of that Association. In the same competition, at the Ottawa Exhibition, 8 prizes out of 10 were taken by members of the same society. Nearly 300 butter and cheese factories sell through the Cheesemakers' Association. Its sales amounted to more than $1,700,000 last year. It has increased this year its reserve fund by more than $10,000. For the last two years it has paid an annual dividend of 6 per cent. The price it has obtained for its No. 1 cheese is higher than the price obtained by Ontario cheese on most of its markets. We may add that the price obtained for the Ontario cheese is superior to the price obtained for the cheese sold by the factories which are not members of the Co-operative Association.

It demonstrates that the grading and selling by the officers of the Association has a most beneficial influence upon the quality of the products. Every week, the grader makes a report to the maker upon the defects of his products, and the ways to remedy them. A remarkable improvement has been the result of such methods.

The association has contributed also largely to the increase of the production of pasteurized butter, which has obtained a higher price than the ordinary butter.

The farmers begin to understand the advantages secured by the dealings of this Association, and, in many circumstances, have compelled their maker to become a member of the society and to sell through its officers.

We have succeeded lately in organizing another important co-operative association; the "Quebec Seed Growers' Co-operative Association", having its chief place of business at Ste. Rosalie. It has already a subscribed capital of $14,000, and the manager hopes to increase it to $30,000 and even

---

again. I heard one man go so far as to say. "Hogs will never be any good again". That was when they went down to 4c. If you had told this man that they would be worth 10c live weight some day, he would have thought you were crazy. I do not think it is common sense for a man to get discouraged simply because the price goes down temporarily.

I think the stock raiser should adopt the motto. "Business as Usual". That is the motto they have up in almost every business concern in the country to-day. I would add to that, "Quality better than usual." If we stick to these two mottoes, we are bound to come out ahead in the long run.

THE GRAY NUNS' BARN AT ST. LAURENT

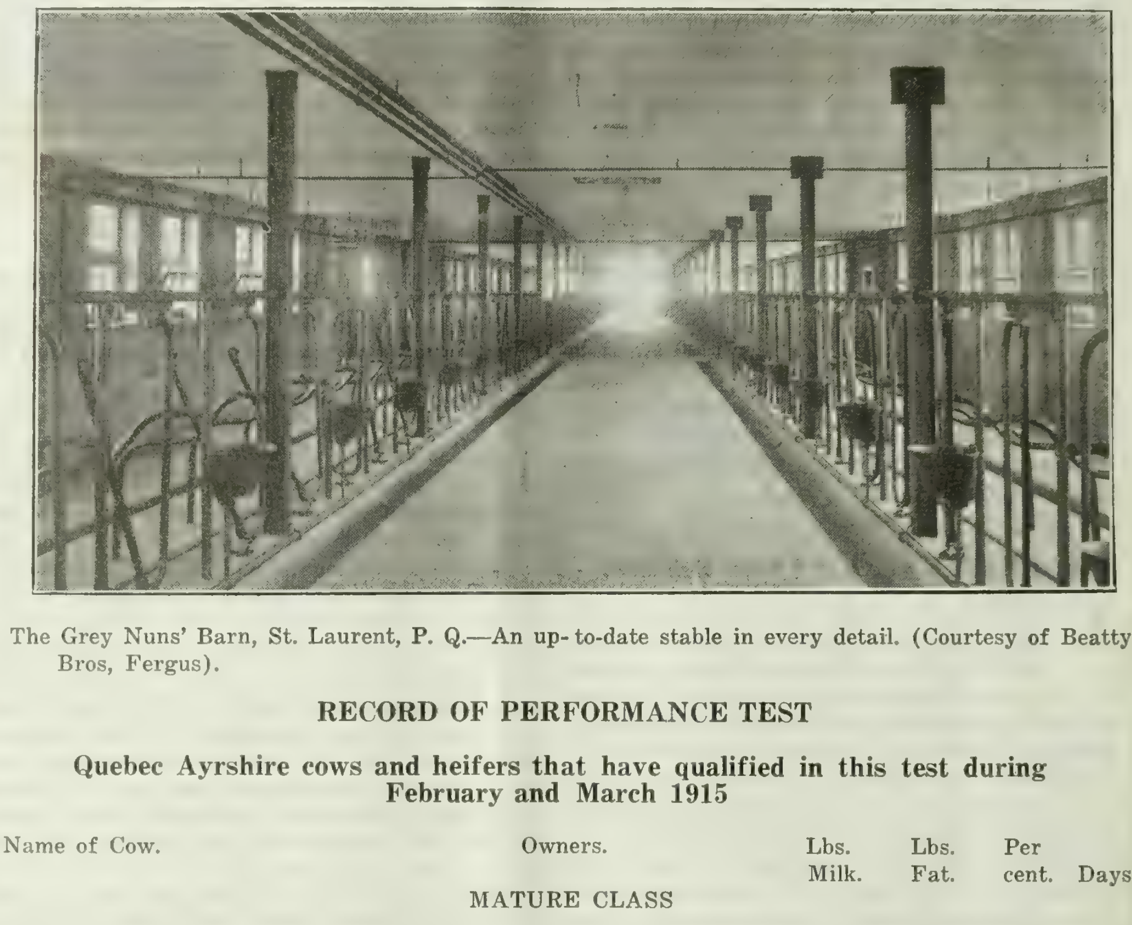
The accompanying illustration shows the fine new stables of the Gray Nuns at St. Laurent, P.Q.

IT shows how a barn should be lighted, ventilated and equipped to keep the cows healthy and comfortable and get the best results from them. The stanchions are of a swinging type so that the cow can turn her head freely and card herself on any part of her body. They can be adjusted backwards and forwards to suit the length of the cow to the length of the cattle stand. No manure gets on the bedding or on the passage. Notice that the cows are watered in the barn and there is a water bowl for every two animals.

Abundance of sunlight is provided and there are no dark corners. Note the openness of the steel construction.

It is ventilated with the Rutherford System. The inlets can be seen along the walls, and the outlets can be seen between the hay shoots above the central passage. The windows are thrown open in the summer time to allow a gentle current of air to pass through the barn. This is a "T" shaped barn, at the top of the "T" there are two double rows of dairy cattle, and in the stroke of the "T" are pens. A little dip will be noticed in the cattle-stand in both sides, which has been found very useful with dairy cattle in retaining the bedding, but it will not do for steers.

Good measurement for cattle stands is 4' 10" x 3' 6" which is plenty of width for dairy stock. The gutter should be 18" wide 7" deep next the cattle stand, and the gutters 4" deep next the walk. They should slope about half an inch towards the walk to permit liquid manure to drain off readily.



The Grey Nuns' Barn, St. Laurent, P. Q.—An up-to-date stable in every detail. (Courtesy of Beatty Bros, Fergus).

RECORD OF PERFORMANCE TEST

Quebec Ayrshire cows and heifers that have qualified in this test during February and March 1915

Name of Cow.	Owners.	Lbs. Milk.	Lbs. Fat.	Per cent.	Days.
	MATURE CLASS				
White Rose, 26614	Hon. Wm. Owens, Montebello,	12423	460	3.70	365
Wylie of Elm Shade, 32553,	D. A. Macfarlane, Kelso,	10364	411	3.96	288
Lady of Pine Grove, 25898,	M. Ste Marie, Moe's River,	10307	405	3.94	352
Garclaugh Rosebud, 24735,	D. A. Macfarlane, Kelso,	10032	396	3.94	286
Arizona 2nd of Fairfield, 31073,	G. R. Palmer, R.R. No. 1, Cornwall, O.,	9152	365	3.99	323
Daisy Bell, 39263,	G.R. Palmer, R.R. No. 1, Cornwall, O.,	8623	379	4.39	327
Jean of G. F., 22287,	R.R.P.P. Trappistes, Mistassini,	8559	394	4.60	323
	FOUR YEAR OLD CLASS.				
Lochfergus Boquet, 33260,	R. S. Pringle, Huntingdon,	10108	418	4.13	335
Ottawa Kate 2nd, 32560,	Director, Expt. Farms, Ottawa,	9097	404	4.44	365
	THREE YEAR OLD CLASS.				
Ravensdale Coquette, 32575,	W. F. Kay, Philipsburg,	7181	307	4.28	335
	TWO YEAR OLD CLASS.				
Primrose of Beaver Meadow, 33930-12350,	W. C. Tully, Athelstan,	12350	463	3.74	334
Torrs Daisy Bell 3rd., 39388,	R. R. Ness, Howick,	12103	451	3.72	365
Auchencloigh Mina, 39386,	Sir H. Montagu Allan, Beaconsfield,	8528	341	3.99	365
Pride of Kelso, 36068,	D. A. Macfarlane, Kelso,	8427	354	4.19	337
Princess of Ravensdale, 384824,	W. F. Kay, Philipsburg,	8219	359	4.36	336
Lakeside Sunbeam, 32706,	Geo. H. Montgomery, Philipsburg,	7251	282	3.88	365
Julia, 36488,	McMillan & Leggatt, Trout River,	6891	283	4.02	339
Hobsland Barbara, 39426,	R. R. Ness, Howick,	6741	250	3.70	309

W. F. STEPHEN,
Secretary-Treasurer,
Canadian Ayrshire Breeders' Association.

Huntingdon, Que.
April 7th, 1915.

to a higher figure. It has bought already a large quantity of registered seeds, which will be resold to its members. The fields of the members who intend selling to the Association will be visited and examined during the summer by experts in order to ascertain whether the crop is pure and free from weeds. The purchasers of the Association will be governed chiefly by the reports of such experts. Such a supervision will have a most beneficial effect on the production of high-class seed, and the farmers will know where they can obtain it. The growers of such seeds will be sure to obtain remunerative prices for their products. The Association has a well-built grain elevator at Ste. Rosalie, and the most improved machinery for the selection and cleaning of seed. It will have also mill stones in order to grind the grain unfit for seeding purposes. This is a most promising association, and will stimulate farmers to improve their methods of farming and to increase agricultural production.

Among the amendments to the laws governing co-operative agricultural associations, adopted at the recent session of the Provincial Legislature, the following may be mentioned.

1. If the election of the directors or of the auditor has not been held in the month of January, the Minister may order another election.

2. The "one man one vote" principle has been adopted. Before the adoption of this amendement, each shareholder was entitled to a vote for each share.

If the board of directors of a society or company above mentioned do not adopt by-laws for the purposes above mentioned, the inspector general of butter factories may himself make such by-laws, but in that case the by-laws made by the inspector general must before coming into force be approved by the board of examiners of the Dairymen's Association.

Every co-operative agricultural society or other society or company which is the owner of a butter factory or cheese factory, or a butter and cheese factory, may:

(a) Take suit in the name of the Society, for all damages suffered by it, against any person bringing to the factory unwholesome or sour milk, or milk that has been skimmed, or in any way adulterated, without notifying thereof the manager or owner of the factory, whether such person is a member of the society or not.

(b) Sue any person or association for damages caused by such person or association to the society in its trade and commerce in dairy products.

The damages which the society may recover shall be apportioned between its members, in proportion to the quantity of milk and cream supplied by each during the time fixed by the board of directors, and in the manner determined by such board.

For the purposes of this article, all damages caused by any person to the patrons who are members of a society, by supplying milk that is unwholesome, or sour or skimmed, or in any way adulterated, shall be deemed to have suffered by and shall be payable to the society, which may sue therefor, and shall distribute the amount recovered, among its members in the proportion above mentioned.

When the society's butter or cheesemaker, or the inspector of the society or the Government inspector, reports that a patron, on account of the quality of the milk or cream brought by him, causes damage to the society, the board of directors shall sue such patron for the damages incurred, unless such patron pays the damages so caused. The owner or manager of every butter factory, cheese factory or butter and cheese factory shall be obliged to sterilize the skimmed milk and the buttermilk and whey produced from the milk or cream brought to and worked in his factory. He must also keep the skimmed milk and the buttermilk and whey in receptacles or vats of metal, not of wood, until sold or distributed. However, the inspector-general of butter and cheese factories may, on account of special circumstances in which one or several factories may be situated, exempt such factory or factories from the obligation to sterilize.

The inspector-general may, at any time, put an end to such exemption by means of a notice in writing, served by registered letter or otherwise. All basins, utensils, cans or receptacles whatsoever, intended to hold the by-products of the milk, must be made of metal.

The inspector or an officer of the Department of Agriculture, when the proceeds of milk or cream are divided between the patrons of a butter or cheese factory, or a butter and cheese factory, is authorized to examine the books of division and the accounts of the factory. No such examination, however, is authorized when the owner of the factory himself buys the milk or cream for his own benefit. The owner and the manager of a butter or cheese factory, or of a butter and cheese factory, must on or before January 15, make a report to the Minister of Agriculture, showing:—1. The number of pounds of milk or cream received at the factory during the preceding year; 2, the number of pounds of butter or cheese manufactured in the establishment during the same year; 3, the number of his patrons; 4, the amount received as the price of cheese made in his factory; 5, the amount received as the price of butter made in his factory.

To assist in defraying the expenses of the inspectors-general, their assistants, and the inspectors or persons appointed to replace them, a sum of $15.00 per annum shall be paid to the Minister of Agriculture before the first of June each year by each butter or cheese factory or butter and cheese factory, or condensed milk or milk powder factory which is in operation at least 30 days in the year.

Any person infringing any of the provisions of this section shall be liable, for each offense, to a fine of not more than $25.00.

THE NEW DAIRY INDUSTRY LAW

At the last Session of the Quebec Legislature, a very important amendment was made to the law on dairying. The Province will be divided into districts, not more than fifty in number. However, this number may be changed by other by-laws adopted by the Dairymen's Association and approved by the Lieutenant Governor in Council. The latter may appoint inspectors-general, assistant inspectors general and an inspector for each district above mentioned. Such officers must be experts who hold certificates of competency from the board of examiners appointed by the Quebec Dairymen's Association. Their principal duties shall be to superintend the production and supply of milk, as well as the manufacture of butter and cheese in the different factories of the Province.

These inspectors will supersede the syndicate inspectors. They will be paid by the government, whilst before one-half of their salary was paid by the syndicates formed by cheese and butter makers. They will be governed by by-laws adopted by the Dairymen's Association and approved of by the Lieutenant Governor in Council.

Every person, company or society carrying on a butter factory shall be bound to engage a head buttermaker who, besides the diploma he must have from the board of examiners, holds a diploma or certificate as milk or cream tester, or both, issued by the board of examiners. Such buttermaker so qualified shall grade the cream brought or sent to the factory by the patrons and shall divide the same into two classes numbered respectively one and two. Class No. 1 shall consist of cream suitable for making first-quality butter, and class No. 2 shall consist of all other cream accepted by the buttermaker for making butter. The cream in each class shall be converted into butter separately.

Each class of butter must be sold separately, and the proceeds of such sale shall be divided among the patrons according to quality, and in the proportion of the quantity of cream in each class supplied by each patron. The cream of each patron must be brought or sent to the factory in separate receptacles. The classification, manufacture and sale above mentioned shall be so made separately in conformity with the by-laws drawn up by the inspector general of butter factories, who is authorized to make such regulations for butter factories, or for one or some of them, as the case may be, provided they are approved by the board of examiners of the Dairymen's Association. In default of such regulations for a factory, the classification, manufacture and sale separately shall not be obligatory; they shall be obligatory, however, if a factory receives milk from a certain number of patrons and cream from others.

Every co-operative agricultural society or other society or company which is the owner of a butter factory or cheese factory, or a butter and cheese factory, may pass by-laws with regard to the classification of milk and cream, the manufacture and sale of butter or cheese, but such by-laws, before coming into force, must be approved by the inspector-general.

Such by-laws, among other things, may regulate:

(a) The classification of the cream brought or sent to the factory into two classes;

(b) The manufacture into butter of the cream of both classes separately, and the separate sale of the butter so obtained;

(c) The separate division of the proceeds of the sale of each class of butter among the persons entitled thereto;

(d) The classification, into two separate classes, of first-quality milk and cream and second-quality milk and cream, the manufacture of such milk and cream into butter, the sale of the butter and the division of the proceeds of such sale in compliance with the provisions of paragraphs b and c.

SHOULD FARMS SELLING MILK TO CHEESE FACTORIES BE INSPECTED?

Editor, Journal of Agriculture,

I wish to call attention to one fundamental defect of our Quebec dairy industry which has not received the attention it deserves.

I learn from the last report of the Milk Shippers' Association of the City of Montreal that dairy farmers shipping milk to the city are regulated by certain strict rules. Milk or cream cannot be sold in the city unless it reaches certain standards of fat and cleanliness. I entirely approve of these regulations.

There are also inspectors sent by the Government to inspect all cheese factories throughout the province to see that they are kept in proper condition and that the cheese is properly manufactured. But the foundation of all troubles is in the beginnings—in this case in the farm yard or stable. For if milk is delivered to the cheese factory in a dirty, off-flavoured condition, it is impossible for a cheesemaker to avoid manufacturing all the dirt and microbes into the cheese, some of which may be sent to our heroes in the battlefield with poor benefit to their health: and the milk being mixed on the way to the factory, so that all the dirt is dissolved, it is impossible for the cheese maker to recognise inferior milk by the naked eye.

I have been in the cheese business for many years and have had plenty of opportunity to observe how the farmers milk their cows and how they handle the milk before delivering it to the cheese factories. I have seen many farmers come from the harvest field and go straight to the milking-yard or stable and commence milking without ever washing their hands or the udder of the cow. I have seen them use pails in which they have watered their horses or fed their calves, perhaps washing the pail with cold water and the naked hand, but never using a cloth or brush and never so much as thinking of sterilizing the pails. The milk cans, filled with sour whey from the factory, will be left standing all day in the beaming sun. They will just empty out the whey, perhaps give the can a wash with cold water, perhaps just use it as it is for the milk. If the cheesemaker makes any enquiry why the cans are not cleaner the reply is generally, "I am not going to eat any of the cheese; so I don't care what is in it". They never think of straining the milk. They just pour it into the can as they get it from the cow, including whatever insects and dirt get in from the air. I have also seen farmers allow the milk cans, holding the milk, to stand in dirty, filthy places in barn yards, near hog-pens and even near the remains of dead calves and lambs. And they will haul the milk to the factory in the same wagons which they use to draw out all the rubbish of the farm. They will cover the cans with old rags to protect them from leaking around the covers on the way to the factory, and use the same cloths for the sour whey on the way home, continuing the process throughout the whole season of cheese-making.

Now, it is my opinion that if milk dealers in the city are protected by the inspection of the shippers' farms, and if all meat is inspected before being allowed upon the market, and if city water has to be filtered and analyzed before its use is permitted, the cheese-maker is entitled to similar protection, so that he may not have to bear the blame and pay the penalty where the farmer is at fault. The factory is inspected and the cheese maker is liable to be penalized, but there is not and has never been, any inspection of the farms delivering milk to the factory. Until there is such inspection it is clearly impossible for our dairy industry to attain the degree of success which we all earnestly desire it to reach.

J. P. GARLAND.

Calumet, Qué.,

(NOTE.—Government inspection of all farms, such as is here suggested, would obviously be expensive. Has not the manager of the factory (with a backing of the directors, if the factory be a co-operative one) the power to control this matter by warning farmers whose farm conditions are unsatisfactory and, if necessary, refusing to accept their milk? We would call our correspondent's attention to the amendments to the Provincial Law, summarised elsewhere in this issue. One of these gives owners of cheese factories and directors of co-operative societies authority to sue patrons delivering adulterated or contaminated milk without giving the manager written notice of its condition. Indeed, the law goes even further and makes it the "duty" of the directors of co-operative societies to sue patrons whose milk or cream is condemned by either the manager of the factory, the inspector of the society or the Government inspector.—Ed.)

SCORE CARD FOR DAIRY FARMS

The following system of scoring was adopted by Harrison, Savage and Sadler in their investigation of the dairy farms supplying milk to Montreal:

SANITARY INSPECTION OF DAIRIES

Owner or lessee of farm: ....
Town: .... State: ....
Total No. of cows: .... No. milking .... Quarts of milk produced daily: ....
Is product sold at wholesale or retail? ....
If shipped to dealer, give name and address: ....
Permit No.: .... Date of inspection .... 191...

	COWS.	Perfect Score.	Score.
Condition and healthfulness.	Deduct 2 points if in poor flesh, and 8 points if not tuberculin tested	10	
Cleanliness.	Clean, 5; good, 4; fair, 2; bad, 0	5	
Water supply.	If clean and unpolluted, 5; fair 3; otherwise, 0	5	
Construction.	STABLES.	20	
	For cement floor or other material equally as good (*a*)* in good condition, allow 2 points; fair, 1; poor, 0; wood floor (*b*) or other material in good condition, 1; fair, ½; poor, 0; good tie (*c*), 1; good manger (*d*), 1; box stall (*e*), 1	5	
Cleanliness.	If thoroughly clean, including floor (*a*), windows (*b*), and ceilings (*c*), 5; good, 4; medium, 3; fair, 2; poor, 1; bad, 0	5	
Light.	Four square feet of glass per cow, 5; 1 point off for each 20 per cent. less than 4 square feet	5	
Ventilation.	Good ventilation system, 4; fair, 3; poor, 2; bad, 0	4	
Cubic space per cow.	If 500 cubic feet or over per cow, 3; less than 500 and over 400, 2; less than 400 and over 300, 1; less than 300, 0	3	
Removal of manure.	Hauled to field daily, 2; removed at least 30 feet from stable, 1; otherwise, 0	2	
Stable yard.	In good condition (*a*), ½; well drained (*b*), ½; otherwise, 0.	1	
	MILK HOUSE.	25	
Construction.	Tight, sound floor, and not connected with any other building (*a*), well lighted (*b*), well ventilated (*c*), 2; if connected with another building under good conditions (*d*), 1; otherwise, 0; if no milk house, 0	2	
Equipment.	Hot water for cleaning utensils (*a*), 1; cooler (*b*), 1; proper pails (*c*) and strainers (*d*) used for no other purposes, 1.	3	
Cleanliness.	Interior clean, 5; good condition, 4; medium, 3; fair, 2; poor, 1; bad, 0	5	
Care and cleanliness of utensils.	Clean (*a*), 3; kept in milk house or suitable outside rack (*b*), 2; otherwise, 0	5	
Water supply.	If pure and clean running water, 5; pure and clean still water, 3; otherwise, 0	5	
	HEALTHY.	20	
Attendants.	Healthy	5	
Cleanliness of milking.	Clean milking suits, milking with clean dry hands, and attention to cleanliness of udder and teats while milking, 10; no special suits, but otherwise clean (*a*), 7; deduct 4 points for unclean teats (*b*) and udder (*c*) and 3 points for unclean hands (*d*)	10	
	HANDLING THE MILK.		
Prompt and efficient cooling.	If prompt (*a*), 5; efficient (*b*), if 50 degrees F. or under, 5; over 50 degrees and not over 55 degrees, 4; over 55 degrees and not over 60 degrees, 3; over 60 degrees, 0; if neither prompt nor efficient, 0	10	
		25	
Storing at low temperature.	If 50 degrees F. or under, 5; over 50 degrees and not over 55 degrees, 4; over 55 degrees and not over 60 degrees, 3; over 60 degrees, 0	5	
Protection during transportation to market.	If thoroughly protected (iced), 5; good protection, 4; partly protected, 2; otherwise, 0	5	
		10	
	Total score	100	

*The letters a, b, c, etc., to be entered on score card to show condition of dairy, and when so entered to indicate always a deficiency.

POULTRY

MORE POULTRY NEEDED

CANADA is short fifteen hundred thousand hens, averaging one hundred eggs per year. Canada in 1914 imported two hundred thousand dollars' worth more poultry than she exported and imported eggs to the enormous amount in value of $2,500,000 in excess of her shipments abroad. These are the somewhat surprising, if not alarming, statements made by the poultry Division of the Dominion Department of Agriculture, from which also emanates the important announcement that Britain took from Belgium, France, Russia, Germany and Austria-Hungary in the available months of 1914, three million dollars worth of poultry and 136,000,000 dozen, or sixteen hundred and thirty-two million eggs—sufficient to give two million two hundred and thirty-five thousand six hundred and sixteen people two eggs apiece for every day in the year. Such facts must surely convey a world of meaning to poultry breeders in Canada. These facts are further emphasized by the statement that the average egg yield per hen in this country is but 80 eggs per year, which we are further assured by experts could, by careful selection, feeding and housing be increased to 180 eggs per hen per year. As the head of the division at Ottawa remarks, "It would be a profitable thing to strive for." Pamphlets particularly bearing on the subject which can be had free on addressing the Publications Branch, Department of Agriculture, Ottawa, are No. 1, "Winter Egg Production" by W. A. Brown; No. 2, "The Crate fattening of Poultry" by T. A. Benson; No. 3, "The Candling of Eggs", by W. A. Brown; No. 4, "The Organization of Co-operative Egg Circles", by W. A. Brown; No. 5, "Plan of Permanent Laying House for Poultry", by W. A. Brown, and T. A. Benson, and No. 6 "The Payment of Eggs According to Quality", by W. A. Brown, J. H. Hare and W. H. Ault. Other publications that can be had are by F. C. Elford, dealing with Incubation and "The Farmer's Poultry House", and by Victor Fortier on "Duck Raising" and "The Management of Turkeys and Geese."

GOOD PROFITS

IN one dairy record centre maintained by the dairy division, Ottawa, in 1914 there were such surprising contrasts in yields of milk and fat that they must command the attention of every progressive dairyman.

The best cow in one herd gave only 4,158 pounds of milk and only 155 pounds of fat; the average of the whole herd was only 3,772 pounds of milk and 136 pounds of fat. In a herd near by the poorest yield of any one cow was 5,658 pounds of milk and 278 pounds of fat; the herd average was 7,255 pounds of milk and 342 pounds of fat.

There were several individual yields of over eight thousand pounds of milk, while one good grade cow gave 14,400 pounds of milk and 562 pounds of fat.

Coming to the cost of feed, plenty of herds had an average cost per cow of from forty to fifty-five dollars; even at these high figures the profit above the cost of feed ran up to forty-six and fifty dollars as the herd average.

Such results are full of encouragement for the owners, and augur well for the future of cow testing in the Maritime Province. Other dairymen may well strive to emulate these records of fifty and sixty-five dollars *clear profit* above the cost of feed as made by good individual cows. This sensible method of determining the respective merit of each cow as a profit maker lays a solid foundation for building up a singularly interesting herd from a modern business standpoint.

C. F. W.

THE COW'S INDIVIDUALITY

IT is still possible to find dairymen who never dig deeper than the surface knowledge of the whole herd giving so much milk, counting simply the total weight sent to the factory one day, or per month, or again simply the average yield per cow for the factory season.

A plain fact that cannot be impressed too strongly is that cows *have* individuality; people have personality. What makes two cows yield quite different weights of milk and fat when all conditions are practically equal? Even supposing a cow's interior economy were made visible and luminous, has any man the requisite knowledge to fathom all the mysteries of milk-manufacture?

We do know this, the yield of milk and its percentage of fat are apt to vary from day to day most strangely. The first half of the milk drawn may not contain more than half as much fat as the latter half; the cow may have some slight sickness; some of her delicate nervous functions may be deranged temporarily; extremes of weather, undue exposure, excitement, may all influence the yield of milk and the test. Hence it is clear that the sensible way to judge a cow's performance is not by any one test or weight, but rather on her *total yield* for the season. A cold, matter-of-fact "average" does not give necessary information. *Cows have individuality,* which is worth studying so that they may repay their owners for intelligent handling. If you are not already testing each cow you own, write the Dairy Division, Ottawa, for forms for recording milk, yields and feed.

C. F. W.

A PERIOD OF REST

IN the fall of 1914 many dairy cows dried off somewhat earlier than usual on account of scarcity of feed. Others stopped milking because their owners have let them get the habit of putting up their shutters at the same time that the cheesefactory boarded up its windows. However long the period of rest may have been, six weeks or four months, cows will soon be ready for business as usual during 1915. Now the point arises, can the period of work be extended? That means careful preparation in a variety of ways.

One item may well be noted by the dairyman who has not yet endeavoured to shorten that rest-period. It does not follow that a cow giving 1,200 pounds of milk or so during her first month will give as much during the whole season as the cow that gives only 800 pounds the first month. The first one may be dry in a little over seven months and then settle down to extended repose, while the second cow will be producing for ten months, enabling her owner to take advantage of good prices in fall and winter. Obviously, therefore, correct judgment as to a cow's production is to be based on a knowledge of the total weight for the season, not for the best month or two only, for that period of rest is a very variable factor.

Keeping track of the weight given by each cow is simplified by using the forms supplied free by the government. Write to the Dairy Commissioner, Ottawa, for samples of the record forms for three days per month, and those for daily weights. It will be still better to take samples as well so as to learn by the test how much fat each cow gives.

C. F. W.

WHAT DO YOUR COWS TEST ?

SUPPOSING you know one of your cows has a test of 3.4 per cent of fat for the first month she is milking, have you any certainty of what she will test the next two months or the last two? One cow in the herd may keep at that first test for three or four months running, another may give far richer milk the third month and the test may increase steadily; or again, with two cows both increasing in the test during lactation, one may increase far more rapidly than the other. Hence, at the end of the season one cow may have given considerably more fat than another which gave about the same weight of milk.

It will thus be seen that the question of "sampling" as well as weighing a cow's milk is of great importance. Neither is it sufficient to sample and test the mixed milk of the herd; *individual quality* is worth study. It should be plainly stated in addition that the times demand more attention being paid to testing, for the simple reason that the general average test seems to be steadily increasing. As milk is valuable in proportion to its cream, or to its test of fat, it is important for the dairyman to know which are his high-testing cows. He may want a specially rich milk for his own table use; he may want an extra good price when selling a high-testing cow; he may want to raise heifers likely to test at least as high if not higher than their dams; so evidently it will pay him to know the test of each cow he owns. It is a simple matter to take samples on three days per month, and get a composite sample tested once a month. Ask the factory in your section to do the testing, speak to the dairy recorder about it, or write to the dairy division, Ottawa, for full information about getting your samples tested free.

C. F. W.

RAISING HEIFER CALVES

THE records of two herds of dairy cows owned by two neighbours furnish a striking example of the utility of dairy records to the man who really wants to build up a good herd. The first man has been cow testing for four years and has selected his cows carefully, studying their various preferences and capacities, each one as an individual. He raises heifers from his best cows; four two-year-olds gave last year an average of 7,144 pounds of milk, while his herd of ten gave an average of 8,059 pounds of milk and 259 pounds of fat.

The neighbour considers it simpler to buy just what cows he can, he does not raise any calves. Last year his nine cows, all upwards of six years old, except two heifers, gave an average of only 4,240 pounds of milk. This is only just about one half as much milk per cow as in the first herd. The best cow gave only 6,355 pounds, less than the average of the four heifers in the first herd. He has nothing on which to start building up a good dairy herd, unless it be his judgment in "picking a winner", which judgment, by the way, does not appear to be of A-I quality. The owner of the first herd has the advantage of four years of dairy records, practically indispensable to the real dairy farmer, besides matured judgment in handling cows to better advantage. Cow testing pays.

C. F. W.

THE GROWING STOCK

We have reached the best month of the year for chicks; the more we can hatch out and get started growing during May the better. But perhaps I am not far wrong when I say that 50 per cent of the chicks hatched never survive their first two weeks of life. This may be due to several causes. Poor parent stock, faulty incubation, chills during the first week, over feeding, too early feeding, lack of grit, empty water dishes, dirty drinking dishes, and very many other things.

Little and frequent feeding are best. Never give the chicks all they can eat at any meal except the last meal of the day, when they should eat all they possibly can. Foods of too high protein content, or a quantity of carbohydrates and fats, are injurious. Fibrous foods, such as oats, whole or rolled, are both hard to digest and often set up inflammation in the crop.

Indigestion is one of the main causes of mortality among chicks. We would often need to go back to the parent stock to fully ascertain the cause of this trouble. Parent stock may have been weakened by improper feeding. Again, a bird which has suffered from roup, or even slight cold, is not going to produce strong healthy stock, and by breeding from such stock we are only heaping up disappointment, for even if the chicks do live and grow to maturity they cannot be expected to produce eggs when we most desire them and when prices are highest.

Lice is another cause of mortality. I never have had really good success with chicks unless their heads, necks and under the wings were "oiled" before they were two weeks old. This is most important when hatched by hens, or if brooded with hens. The easiest and safest plan is to use olive oil, to which a few drops of turpentine has been added. Dip a finger in the mixture and press the down close to the head, etc., and you will be surprised to see the "exit" there is from under the oily surface. Tuberculosis is another enemy of our chicks. Most of the chicks just "picked up dead" are cases of tuberculosis. These chicks will often be emaciated and if dissected when dead, little cheesy lumps will be found on the intestines.

Keep your chicks dry till they are three weeks old, then see that they have plenty of shelter and they will attend to themselves. Don't coddle.

L. NICHOLSON

ARTIFICIAL INCUBATION AND BROODING

On a plant where a large number of chickens are to be raised artificial incubation and brooding methods are the best. With natural methods too much time is taken in preparing nests and feeding and caring for the hens, for the number of eggs that can be incubated at one time. Natural methods, however, are the best and cheapest where only a small number of chicks is being raised.

EGGS FOR HATCHING

First of all is the question of hatching eggs. The eggs must be from good, strong and vigorous stock. If the breeding stock is not in good condition the eggs will be low in fertility, poor in "hatchability" and the chicks will be weak. The eggs should be set as soon after being laid as possible. In nature the hen generally lays twelve or thirteen eggs and then sits, so that some of the eggs are two weeks old. To keep the eggs in the best condition for hatching, they should be kept in a cool dark room.

It is not necessary to turn the eggs unless they are being kept for some length of time. The eggs should be candled or tested before setting so as to discard any cracked ones or blood spots and any with poor shells. Select only the best shaped eggs for incubation.

PREPARATION OF THE INCUBATOR

The first thing to do is to disinfect the incubator and wash the trays with a solution of ten per cent zenoleum or any other good disinfectant. Then start the lamps and let the machine become dry and aired. Now put in the egg trays, also the moisture trays if it is a moisture machine, and a thermometer. The moisture trays should be filled with sand and enough water to be seen on the surface. Let the regulator down on the head of the machine. When the temperature rises to one hundred and three degrees set the regulator so that it just touches the head of the machine and rises if the temperature goes above one hundred and three degrees. The flame of the lamp should be about one quarter of an inch high. If the temperature varies, it may be regulated by the flame of the lamp. Do not change the regulator after it has been set.

Now bring the eggs and fill the trays. A little space should be left so as to be able to turn the eggs. Put the trays in the incubator and do not touch them for the first three days. The trays should be removed on the fourth day and the eggs should be turned and cooled. In turning, just roll them over to change their position so that the yolk will not settle to one side and stick to the shell. Cool them till they feel cool to the hand, but warm to the eye or cheek. The temperature should be kept at about one hundred and two and one half degrees the first week and gradually brought up to one hundred and three degrees as the hatch advances.

Have a card to record the temperature of the incubator and also the room. The temperature of the room should be kept as even and the air as moist as possible. The lamp should be cleaned and filled once a day. The flue of the chimney must be swept occasionally. The first test is made on the seventh day. The infertile eggs and blood rings should be removed from the trays. The second test is made on the fourteenth day when all the dead germs should be removed from the trays. The turning and cooling of the eggs should be stopped on the eighteenth day. A good plan is to sprinkle the eggs with a little warm water on the nineteenth day. The moisture trays should be removed and the chick trays put in on the nineteenth day. The nursery row should be opened so that the chicks may go down below the eggs, when strong enough to come to the front of the machine.

When the chicks begin to hatch, a piece of cloth or paper should be hung in front of the glass in the door of the incubator to keep it dark so that the chicks will not crowd to the front and be restless. The ventilator should be opened to give the chicks fresh air. When the hatch is over the trays with the egg shells and bad eggs should be taken out and the chicks left in the machine for at least twenty four hours. Very few chicks that are too weak to hatch are worth helping out of the shell. A high percentage of the chicks of that kind are cripples or weak and generally die or do not grow well. Sometimes it is the lack of moisture that prevents the chicks from hatching. The shell gets too hard for the chick to break through. It is a good plan to leave the chicks in the incubator till they get active and hungry. A baby chick can be shipped within two days distance if properly cared for on the journey without any food or water.

The chick takes the yolk of the eggs into its body just before it hatches and the chick must absorb the yolk before getting any food to eat. More chicks die from being fed too soon than any other way.

PREPARATION OF THE BROODER

The brooder should be dry and properly disinfected. Then put some nice short chaff or shavings on the floor about one and one half inches deep. The temperature should be between ninety-five and one hundred degrees so as not to give the chicks a chill when they are changed from the incubator to the brooder.

Chick grit should be placed on a piece of board or in a low dish for the chicks to eat before getting any food. The chicks should eat enough grit to fill their gizzards before getting any other food. A small fountain filled with water and one filled with sour milk if possible, should be placed in the brooder. The water should be changed twice daily. The fountains should be washed once a day with warm water with a little disinfectant in the water. Sour milk or butter milk are of high food value for chicks. The acid in the sour milk tends to kill the bacteria of certain diseases which affect the chicks. If milk is being fed it should be fed sour at all times. As it is very hard to feed sweet milk, when it is kept before them, the best plan is to feed sour milk. The sour milk should be thick. The change from sweet to sour milk would upset the chicks, digestion. Keep the chicks under the heat of the hover as much as possible the first few days.

The first food should be given to the chicks three or four hours after they have been put in the brooder. It should consist of bread crumbs mixed with milk so that it is moist but not sticky.

Chicks should be fed five times a day for the first month. The first feed in the morning should be as early as possible and the last feed at night as late as possible so as not to have too long a period between the last feed at night and the first feed in the morning. It is best to feed bread crumbs and milk for the first two days and on the third day start feeds as follows:—

1st feed.—Bread crumbs and milk,
2nd feed.—Commercial chick food, or finely cracked corn, wheat and hulled oats.
3rd feet.—Rolled oats,
4th feed.—Commercial chick food.
5th feed.—Bread crumbs and milk.

The feeding should be done at as even intervals as possible. The feeding periods should be about two and one half hours apart. When moist mashes are being fed, do not feed any more than the chicks will clean up in ten or fifteen minutes. As soon as they have finished eating remove any mash that may be left or it will turn sour and cause stomach trouble if eaten. A balanced ration of mash containing foods with a high percentage of protein should be gradually worked in to take the place of the bread and rolled oats. A good mash is as follows:

By weight.—Bran, 2 parts.
Oatmeal, 2 parts.
Cornmeal, 1 part.
Middlings, ½ part.
Beef Scrap
or 10%
Fish Scrap
Bone meal, 2%.

A reasonable amount of powdered charcoal should be put in the mash. A supply of grit, oyster shell and ground bone should be kept before them at all times.. A little mash should be gradually added to the bread crumbs until at the end of the second week use all mash, unless bread can be obtained cheaper. A good plan is to add a little grit to the moist mash. The dry mash may take the place of the rolled oats for the noon feed at the end of the first week. Pure bran and a little meat scraps are good if a balanced ration cannot be had.

Green food should be supplied after the chicks are four or five days old. Sprouted oats or lettuce are the best. The sprouted oats should be clipped in short lengths for the small chicks.

The brooder house should be situated so that the chicks may be let out on the ground as soon as the weather permits. Put them out on the bright sunny mornings providing there are no cold winds to give them a chill. The chicks should never be crowded as they do better in small numbers. Keep the chicks growing and do not let them get any set back by neglect of feeding or watering as they take a long time to recover. When the chicks are about a month old they may be put in larger numbers. The heat of the brooder house should

WOMAN'S WORLD

CORRECTION.—In our last issue, under the heading of FOODS AND FOOD PREPARATION, we regret that an error was made in the descriptions of the two illustrations on page 222. The illustration described as "1st Cut Prime Rib Roast" should be "Porterhouse Steak", and the illustration described as "2nd Cut, Prime Rib Roast" should be "Delmonico Steak".

FOODS AND FOOD PREPARATION

Lesson XIV

PROTEIN OR NITROGENOUS FOODS

Meat (continued.)

A study of the diagram of a side of beef soon reveals the fact that the greater portion of beef must be classed as "tough cuts"—the ribs and the loin being the only "tender cuts".

The tough cuts are cheaper than the tender cuts but this does not mean that the tender cuts are the most nutritious. The two nutrients in meat are protein and fat, and investigation has shown that the protein obtained from a given weight of meat differs very little either with kind of meat or "the cut." The difference between the cuts is chiefly in the amount of fat.

The Digestibility of Meat

The question whether the cheaper cuts prepared by the longer method are as thoroughly and as easily digested as the tender cuts broiled or roasted has been satisfactorily answered by work which has been done as part of recent nutrition investigations. The results obtained show that, so far at least as present knowledge is concerned, there is practically no difference between the various cuts of meat or the meats from different animals with respect to either the thoroughness or the ease with which they are digested.

Over 95% of the protein and of the fat of all kinds and cuts of meat is digested by the body under normal conditions, which means that meat is a very thoroughly assimilated food and that there are no marked differences in the thoroughness with which different sorts are digested.

The experimenters say: "It is commonly said that meats of different sorts vary decidedly in digestibility; for instance, that red meat is less digestible than white meat, or beef than pork, or that a cheaper cut is less digestible than a tender steak. As regards the thoroughness of digestion, the results of the extended series of tests reported show that such differences do not exist in any appreciable degree and that meat of all kinds and cuts is to be classed with the very digestible foods." Therefore those who wish to use the cheaper cuts need not feel that in so doing their families are less well nourished than by the more expensive meats.

Texture and Flavor of Meat

The chief difference to be noted between the cheaper and more expensive cuts is not so much in their nutritive value as in their texture and flavor. The tender piece of meat has tender walls to its muscles tubes and the tubes and fibres are surrounded with very thin connective tissue and so the result is a fine "texture." In old animals and in those parts of the body where there has been much muscular action, the neck and legs, for example, the muscle tubes have tough walls and thick, dense connective tissue.

Flavor in meat depends mainly on certain nitrogenous substances which are called extractives because they can be dissolved out or "extracted" by soaking the meat in cold water. They are usually considered better developed in older than in very young animals. Many persons suppose extractives or the flavor they cause are best in the most expensive cuts of meat; in reality cuts on the side of beef are often of better flavor than tender cuts. *The extractives have little or no nutritive value in themselves but they are of great importance in causing the secretion of digestive juices at the proper time in the right amount,* and of the right chemical character. It is this quality which justifies the taking of soup at the beginning of a meal and the giving of broths, meat extracts and similar preparations to invalids and weak persons. These substances have little nutritive material in themselves but they are great aids to the digestion of other foods.

Tough cuts of meat must be cooked by slow cooking and moist heat. High heat hardens tough meat. Stewing, braising, pot-roasting, casserole cooking, fireless cooker cooking, and fricasseeing are suitable methods of cooking "the tougher cuts". No matter what the cut, whether expensive or cheap, it cannot be utilized to the best advantage unless it is well cooked. Poorly prepared meat dishes are almost inevitably wasted at the table. A cheaper cut well cooked is much more satisfactory as well as more economical than an expensive steak so badly cooked that it is hardly possible to eat it.

Slow cooking softens the muscle tubes and softens the connective tissue, converting much of it into gelatine. Browning the meat first develops flavor, seals the juices in the meat, and browns the gravy. If meat is floured before it is seared the gravy is thickened and is also browner. The addition of diced, browned vegetables and suitable seasonings adds greatly to the palatability of stewed or casseroled meat.

A TABLE OF INFORMATION ABOUT CUTS OF MEAT

Beef

Name and Location of Cut.	How Sold.	Character and Quality of Meat	Prepared for Eating
Loin. All between first rib and rear end of hip-bone.	In slices: a. one to two inches thick—Delmonico porter-house, and sirloin steaks; b. thicker slices for roasting.	Lean, mostly tender fat on edges; little bone. Sirloin steaks: 1. Hip-bone sirloin next to the porter-house, with large tenderloin, is the best; 2. Flat-bone sirloin second choice. Larger tenderloin, round-bone sirloin, poorest.	Best quality for roasting and broiling.
Rump. Back of Loin.	Sold either whole or in halves. In latter case, aitch-bone is split in two.	Tough with considerable bone.	Corned and broiled. Excellent pot-roast.
Round. 1. Top inside of thigh.	Sliced, or cut thick. Best part of bottom round sometimes cut with top for dealer's advantage.	Solid piece of juicy fairly tender, lean bordered with fat. Good meat has thick piece of fat between top and bottom round.	Excellent for braising, pot-roast, and beef loaf, also for beef juice and beef tea; fairly good roasted or broiled.
2. Bottom : outside of thigh.	Cut thick.	Similar to top round, but tougher, has streaks of gristle.	Pot-roast, soup, mince meat.
Top Sirloin. Between sirloin and round.	In steaks or for roasts.	Solid piece similar to top round.	Fairly good steak; excellent pot-roasted.
Prime Ribs. First six ribs.	Sold in pieces containing upper parts of two or more ribs may be boned and rolled; with ribs left in is called "standing roast".	Similar in quality to loin, but has more bone and no tenderloin.	Fine roasts.
Blade—7th, 8th and 9th ribs.	Cut like prime ribs; blade removed.	Similar to prime ribs, but has more gristle and bone.	Braising, Beef loaf, stews, hamburg steak.
Chuck — 10th, 11th, 12th and 13th ribs.	In steaks, or boned and rolled.	Spinal processes long, tough.	Braising, pot-roasting, or stew.
Neck.	To suit purchaser.	Juicy and well flavored but tough.	Excellent for stews and soup.
Brisket.	To suit purchaser.	Layer of juicy well flavored meat over fat and bone.	Boiled or corned.

---

be gradually lowered as they grow older. If the chickens are fairly feathered at a month old, the brooder house will be plenty warm enough at seventy degrees. The grain ration may be made a little coarser and dry mash should be fed in open self-feeding hoppers. Soon after the chicks are put on the range, the grain may also be fed in self feeding hoppers. This cuts the labor down considerably. Feed moist mash and change water twice daily.

The sexes should be separated as soon as they can be distinguished and the cockerels should be forced to broilers and friers. The pullets should not be forced or they will lay early and moult when they are put in the laying pens in the fall. The key to success is patience and careful attention to the small details.

W. A. MAW,

Macdonald College

Cross-Rib. Lies across the ribs.	To suit purchaser.	Muscles all run one way; no waste.	Pot-roast or inferior steak.
Plate. On the side below ribs.	To suit purchaser.	Has layers of fat and lean, with thin bones (ends of ribs) at bottom.	Corned and boiled.
Navel. Middle part of belly.	To suit purchaser.	Similar to Plate, but has less bone.	Usually corned and boiled.
Flank, below the loin. 1. Thick flank. 2. Flank steak.	1. To suit purchaser. 2. Whole.	Coarse and tough; no bone, fine flavor. (Should not be corned, because it has no fat or bone to protect its juices.)	1. Stewed or boiled. 2. Rolled and braised.
Fore Leg or Shin.	Whole or to suit purchaser.	Tough, with bone and tendon.	Soup.

COOKING TOUGH CUTS

1. *Stewing.*

PLAIN STEW. Remove skin and superfluous fat from meat. Cut in suitable pieces—not very small. Beef is better in large (2-inch) cubes or cut into strips and these strips made into small rolls with a bit of suet in centre. Cover meat with water and simmer until tender (two to four hours). Thicken gravy with flour, using 2 tblsp. to 1 c. liquid and season according to meat used. Any vegetables in season are added last hour of cooking. Season with salt and pepper.

IRISH STEW.

3 lbs. lamb or mutton (shoulder or neck).
½ c. carrot.
½ c. turnip.
One onion in slices.
4 c. potatoes in slices.

No flour is needed to thicken gravy. Rice may be used in all stews and strained tomato juice substituted for some of the water.

2. *Fricassee.*

Cut the meat in suitable pieces and roll it in flour. Sauté a golden brown in hot fat in frying pan. A fricassee is often called a brown stew as the method is the same as in stewing, only the meat is sauted a golden brown before stewing. This is very suitable for beef, mutton and fowl, but fowl is sometimes browned *after stewing.*

As in stewing, vegetables in season may be added the last hour of cooking, and some tomato juice may be used with the water, bay leaf, a few pepper corns and a little Worcester Sauce being used for additional seasonings with salt and pepper.

With fowl only salt and pepper and celery are used, as other seasonings would destroy the delicate flavor.

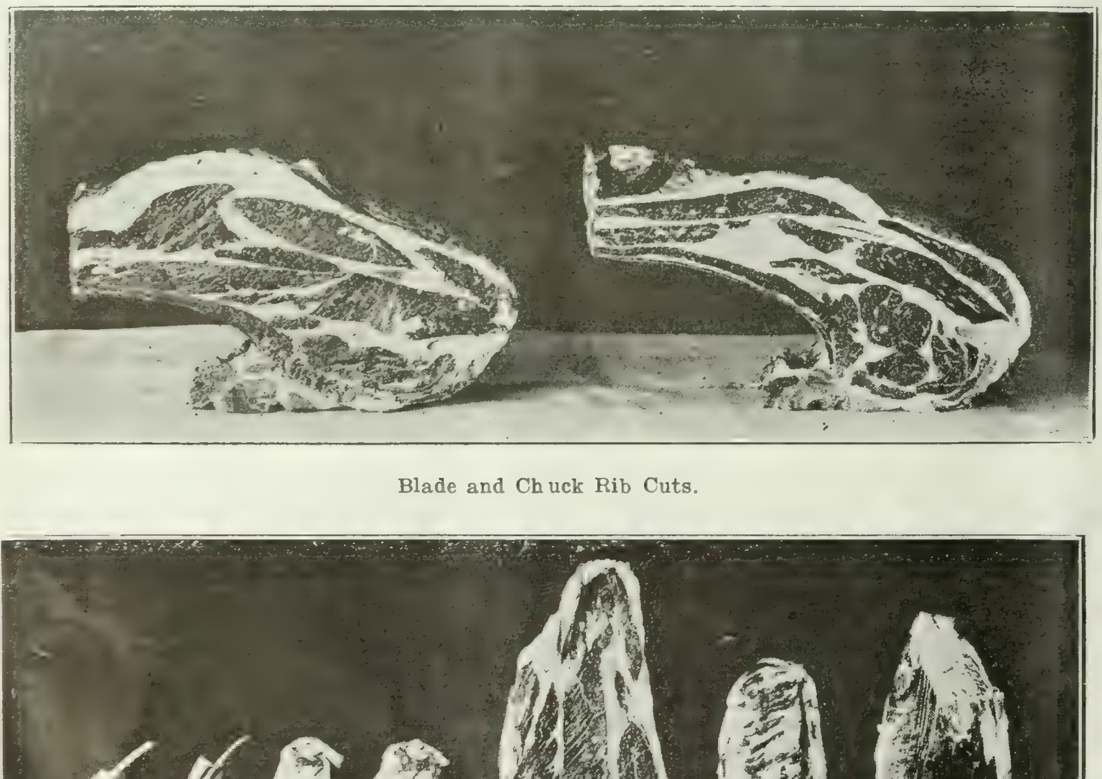
BEEF FRICASSEE (BROWN STEW)

Prepare meat and cook as directed. Serve on a platter with a border of rice and buttered carrots, peas or onion inside rice border.

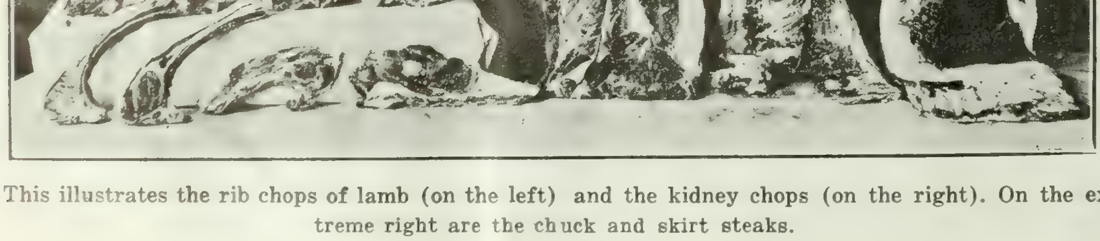
TURKISH PILAF

½ c. rice.
¾ c. tomatoes.
1 c. stock.
3 tblsp. butter.

Stew tomatoes and press through sieve. Heat stock in upper part of double boiler. Add washed rice and cook until tender. Stir in butter carefully with a fork. Serve as border with stew.



Blade and Chuck Rib Cuts.



This illustrates the rib chops of lamb (on the left) and the kidney chops (on the right). On the extreme right are the chuck and skirt steaks.

3. *Braising.*

Is a combination of steaming and baking. Dredge meat with flour, salt and pepper. Sear the meat on all sides in a hot pan, using some "tried out" fat. Place it in a baking pan. Add water to just cover bottom of pan and arrange around the meat vegetables cut in pieces. Cover and cook in a moderate oven from 3-5 hours according to the size of the cut. Uncover during last half-hour of cooking. Stewed strained tomatoes may be used as part of the liquid.

4. *Casserole Cooking.*

This is really braising. For long, slow cooking the stone casserole is ideal. The meat may be cut suitable for individual service. Brown the meat as in pieces as for stewing or left in pieces or slices in braising or fricasseeing. Arrange in casserole with barely enough water to cover meat. Rice, vegetables, a little Worcester Sauce, bay leaf, or a few pepper-corns may be used for seasoning and strained tomato juice may substitute some of the water. Thin slices of raw potato may cover the top.

BRAISED STEAK WITH BREADCRUMBS.

Select a round steak or slice from shoulder or chuck, at least 1 inch thick. Season with salt and pepper and pound (using a meat pounder) fine, dry, bread crumbs into each side. Brown well in hot fat. Cook in casserole with some water to keep from burning, or half water and half tomato juice. Cook two and one-half to three hours in slow oven. Add onion, celery, carrot, etc., last hour of cooking.

5. *Beef Loaf.*

2 lbs. round or shoulder of beef.
Grated rind of ½ lemon and juice of ½ lemon.
1 tbslp. chopped parsley.
1 egg.
Few drops onion juice.
Salt and pepper.
4 slices bacon, (or ¼ lb. fat pork or suet).

Remove all the skin and gristle from meat and chop it finely with the bacon. Add beaten egg and other ingredients and form into a roll. Cover with pieces of suet or bacon fat, steam half an hour and bake in oven until brown (covered with pieces of fat). Some dried bread or cracker crumbs may be used when forming into loaf, and a *little* marjoram and thyme used for seasoning. Serve with tomato sauce, or any of the brown sauces.

6. *Soup Stock.*

Wipe meat and cut in pieces. Have bones sawed in short lengths. Saute part of the meat a deep brown and cover bones and meat with cold water, allowing 1 qt. to 2 lbs. beef. Let stand half an hour and simmer for six hours. Prepare vegetables by washing and paring or peeling and cutting into small pieces—a little onion, celery, carrot, turnip, parsley. Add during last two hours of cooking. A bay leaf and a few peppercorns may also be used. Strain soup and *cool quickly.* Before using remove cake of fat. Keep stock in a cool place and watch carefully in hot weather.

NOTE: Any of these recipes may be carried out to good advantage in a fireless cooker.

The number of tasty dishes which a good cook can make out of the cheaper cuts of meat is almost endless. Undoubtedly more time and skill are required in their preparation than in the simple cooking of the more expensive cuts, just as more time and skill are required for careful, intelligent marketing than for haphazard ordering, but the real superiority of a good cook lies not so much in the preparation of expensive or fancy dishes as in the attractive preparation of inexpensive dishes for every day and in the skilful combination of flavors.

E. B. RUTTER,
School of Household Science,
Macdonald Colleg

OF GENERAL INTEREST

BREEDING DAIRY CATTLE

EVERYTHING that the dairy cow has that helps or hinders, she has inherited. I think we do not realize as fully as we should just to what extent our animals do depend upon their inheritance. If we are going to keep and improve our animals we must give breeding study so that we can produce 500 or 600 or even 400 pound cows with a greater degree of certainty than now.

Endeavor chiefly to have the animal inherit capacity. Inheritance on the part of the animal's efficiency or capacity will do a good deal but not

COME LET US LIVE WITH OUR CHILDREN

By a Kindergartner

(Continued from our April 1st issue.)

PERHAPS one of the most unique theories of the Montessori system is her idea of discipline.

She believes that the ordinary idea of discipline confuses the children and makes them mentally inactive, whereas if the individual child enjoyed liberty, he or she would be the gainer in the end. She says: "Discipline must come through liberty". She is not very explicit as to how this principle is to be carried out; so much is left to the sympathy and good judgment of the teacher or mother.

In reading accounts of the work done in the Montessori schools of Rome we feel that the wonderful influence of personality which Madame Montessori exercises has had much to do with the happy results which she has obtained.

She tells us that her pupils work in silence at their tasks, each having chosen his position or seat in the room, each so intent that he is oblivious to all else. We all appreciate silence and the restfulness of a quiet room, yet few kindergartners can exhibit a room full of little children, all happy, all busy at their chosen and various occupations and all *silent*. The truth is that little children—at least the ones we know—do not naturally love silence. Little children love to talk and if left to themselves will express their thoughts aloud even though there may be no other person in the room. Silence for any length of time is not natural to a little child, it is rather one of those virtues which children have to learn to appreciate in consideration for the rights of those about them. A child loves sounds and noises. He will spend an hour or more beating on his new drum, while his mother is almost distracted with the din. I think that adults rather misunderstand little children in this respect. Silence is not one of the "natural impulses of the child left to himself" and, again, sounds do not distract little children as they do an adult. The natural inclination of the child at work and interested in that work is to talk about it. A little child may be so engrossed in playing shop that he will be quite oblivious to the fact that his mother has called him several times. His concentration is fresh and keen. He has not yet learned, as adults have, to be impressed by every passing distraction.

If the children in a school room are absolutely silent for any length of time it is because others, and especially the teacher, need that silence in order to carry on their work. It is not absolutely necessary to the normal child. It is only in later life, when we have been drilled into attending to all distractions and by suffering in consequence of not doing so, that we become unable to concentrate our thoughts on the work in hand to the exclusion of all else.

Have we not often witnessed a scene in which the instincts of the child stand out prominently?—A little child is brought to an entertainment by his parents, perhaps for the first time. He listens for a short time and, discovering that there is nothing of interest to him going on, he searches for something to do. He discovers that he can put on and take off his new gloves himself and through the whole of the rest of the performance he is absolutely oblivious to all else. The sound of voices about him does not disturb him in the least. He looks up quite surprised when his parents rouse him from his preoccupation when the performance is over.

We feel that the mother, who while making bread gives her little one a small piece of dough that he may make a little loaf of his own, is a real Montessori mother, yet many mothers would consider the small piece of dough of more value than the effort which the child will exert in making his little loaf. Many mothers, day after day, crush inclinations to do and to make with such expressions as, "Run away", "Be quiet", "Sit still", etc. Under the stress of the many duties of housekeeping and in preparing food for her little ones, the mother instinct of sympathy and understanding is crowded out.

Madame Montessori has awakened mothers and teachers to an appreciation of their responsibilities as no other teacher of modern times has been able to do.

It has been said that there are two sides to education—that which we get for ourselves and that which others give us, e.g. we may become expert in using a saw by our own efforts but we cannot learn history unless someone instructs us. Madame Montessori treats almost exclusively of that side of education which comes to us through our own efforts. All her materials deal with problems which the child must solve for himself. He is not told what to do, but with her materials what has to be done is obvious, e.g. a set of insets is prepared, cylindrical forms in different sizes, to be set in holes of the same sizes. It is suggested to a child undertaking this work to feel first the edge of the hole and then, feeling the edge of the cylinder, to place it where it fits. As soon as he can do this with ease there is nothing more to be done with this particular material and although it has given excellent scope for the training of the senses there is practically no use of the imagination, no scope for invention, in which it differs radically from the Kindergarten material which gives free scope for invention.

The other side of education—that which we get from others—is presented only as suggestion and encouragement. A very small measure of instruction is given. The interesting plays, songs and stories of the Kindergarten find little parallel in Montessori practice. We cannot but regret this.

However we believe that Madame Montessori is still experimenting; schools on a Montessori basis or in combination with Froebelian methods are springing up everywhere and are likely to obtain important results. It is possible that a new method may yet arise which will combine the best characteristics of both systems.

In the meantime amidst our conflicting opinions and pet theories, it may be reassuring to remember that after all, honest love is better than shrewd handling; that the child's human nature will rise above our mistakes in methods; that true motherhood, loving, sympathetic and unselfish is more efficacious in its instincts than even experts may be with all their knowledge of pedagogy and psychology.

To what excellence then shall we attain when to those loving instincts of motherhood we add that knowledge of pedagogy and psychology which experts and scientists can offer us?

F. K.

ON WEEDING

WEEDS are good for analogy, and one or two, I know, are good for greens; but except for an indirect value in the making of muscular and moral strength, that is all the weeds in my garden are good for.

By analogy they dispose, once for all, of that comfortable modern doctrine that it is possible so to fill the soul with virtue that there shall be no room for vice. It sounds easy and cheerful and plausible that if only I am positive enough about keeping the boy's mind active upon right things, his mind will never have room for weedy thoughts. But who can grow his garden so thick with flowers and vegetables that there shall be no room for weeds? Leave room to grow at all, and there come the weeds. No sophistry can change them, no kindness regenerate;—they have to be uprooted. The one comforting analogy from weeds seems to be that a soil rich enough to grow a hardy crop of luxurious weeds, *may* be made to grow better things; but we have no more successfully eliminated weeding from ethics, than we have from the garden.

Lamb's quarter is a pretty, delicate, little weed, with its green satin leaf purple-faced. It is hard to be ruthless about eradicating it from the strawberries and the asparagus. It was a real joy to learn that, long before the ruddy beet-leaves or the silver stalks of the Swiss chard would be ready to eat, lamb's quarter would make delicious greens. And greens are full of iron, in one of its few assimilable forms. It is a pity to lose the ancient knowledge of the race, and ignore the value of this and other pot-herbs of good flavor, such as the young shoots of bladder-campion and the dandelion.

And behold! Another analogy,—some weeds are good for greens,—there's iron in them. Some weedy growths in the soul may be good, may have iron in them; but even so they'll hurt the strawberries and the asparagus. Let them grow, if you know what they are good for, but in the right place, and cook them when they are young and tender, with lots of butter.

But plain weeds, the prickly Canada thistle, and pusley, the bindweeds, and shepherd's purse, the various cockles and ragwort, upon these you must wage relentless war and count your good muscle and the harm you have prevented your only rewards.

When the beautifully illustrated weed-book includes in its list the blue-eyed chicory, the brown-eyed Susan, the buttercups and daisies, even the trailing delicacy of the wild morning-glory and the sweet wild rose, I am divided in soul, like many a student of ethics, whether things of such beauty can be called by the same name as the coarse plantain, and thought of as things to be exterminated. Reconsidering, I bethink me that in my garden plot the dandelion looks unlovely, in whose beauty in the adjoining meadow I rejoice. Could we but make gardens of our empty spaces with these sturdy, wild beauties and keep them there! Could we but do so with the soul-growths that are often in themselves a beautiful, delicate product of life!

A gardener is a moralist. It is impossible not to meditate upon life, when you are weeding. The sun is hot upon your back, which aches a little as you shift the weed-cutter from the tired right hand to the less skilful left, which you know will presently shirk it back again. Your low-heeled slippers are full of earth-crumbs and your hands are grimy; homely odors fill your nostrils, and your eyes, noting the growth of desired plants while they seek intruders to destroy, take in a thousand subtleties of color and of form, while all your soul is free and quick with thought. Truly, weeding is a moral exercise, and many a lurking shoot of morbidness or malice comes out with the pusley, or is cut off sharply with the thistle.

MARGARET GRAY

everything. We do not appreciate this as much as we should in getting the best results. The fact that two animals have the same parents does not always mean that they will inherit the same characteristics. There may be an animal not so well bred which when given good care does very well. Another cow, well bred, has not done much on account of poor care. The result in both cases is not a result of inheritance. I do not care how well bred an animal is or what it ought to inherit, it must show what is in it. If it has not inherited a capacity to produce largely there is nothing you can do in the way of care and feeding to replace that inheritance. What it can produce and the limit of what it can do is always what it has inherited, if given the proper attention and care under all circumstances. Assume that to be done, then the difference is altogether the result of inheritance.

How many qualities of an inherent nature has the dairy cow? We can only speculate at the present time. This system of studying the elements of efficiency, capacity and merit, we must get hold of. We can divide the dairy capacity into digestive capacity, dairy temperament, ability to secrete fat, ability to secrete fluids, then constitution and finally beauty. If we can break up the dairy capacity into those six elements, we can get somewhere. I do not mean to infer that there are only six different points, as some of these might be subdivided. Digestive capacity can be analyzed into stomach capacity, secretive capacity and others.

Just how high records are to go is useless to speculate. Not very many years ago, they never thought of a thousand pound cow. Take a thousand pound cow, she is limited in some way. What keeps her from going higher? It may be lack of digestive capacity inherited. More cows are limited by incapacity to digest food than any other one way perhaps, but some of our best cows have capacity in that respect that is all that can be desired. Perhaps they have a lack of constitution to keep up and can only make short records on that account. Another is limited in ability to secrete solids or fluids of the milk.

Consider what qualities make good and what qualities limit a cow. By that I mean that it is not safe to breed by records alone. While an animal may be a 500 pound cow it does not always follow that her daughter will be a 500 pound cow. In order to raise the records of the cows we have got to determine what qualities they have that help and what qualities they have that hinder. Hold the good characteristics, improve and add to them, and eliminate the points in which there is a weakness. If we breed by records alone we will very likely be doubling up on some of these weak points.

One other thing to render breeding more scientific, to make it more certain — the progressive dairyman has ceased breeding to unproven bulls and uses mainly tested sires. Take a young sire and test him before he is used largely. Try and not bank on him until his heifers have been in milk long enough to determine their value as producers. It may sound impractical, but it is the best thing to do. The best bred and most promising sire is not valuable until he is tested. he should not be used to any extent until his heifers have been in milk, to show how well he has turned out as a breeder. It may mean great expense and trouble in keeping him around and not using him much. It is, however, very insignificant when you consider what may be gained. Many good sires go to the block before their value is known. There have been many losses in a good big herd by the use of an animal that was a failure, and a lot of damage has been done before the fact was discovered. To prevent the use of a poor sire, the cost and trouble of keeping a sire around until he has proven good is insignificant. Even at the best it is a matter that requires courage to put into practice in the smaller herds. This may be overcome by co-operative breeding.

Constitution, vitality, vigor can be improved and strengthened and helped by breeding just as milk or fat production can be improved. There is no reason why an animal that is pampered, highly fed and cared for should decrease in production, vitality or health. With the other elements, better capacity, etc., study constitution and breed for it. It can be improved and helped just as much as any other quality. It also requires constitution to stand up under the strain of heavy production. We should strive to improve every point in which we consider our cattle to be lacking, but we must also remember that there is some danger of losing what we already have. Some breeders of Holstein cattle, for instance, endeavor to improve the percent of fat and are quantity; while the Jersey men are sometimes inclined to sacrifice on the inclined to sacrifice quality for quantity. It is a very important point to hold all the good characteristics that you have and add to them as you can, but do not try to gain one point by the loss of another. The man who is willing to sacrifice quantity for quality is going toward the other type. The first point of all is to know where the strength is and to hold that and then add what other desirable qualities you can. Do not let down on one thing to get another, better go to the other type if that is what you wish.

When we get to studying the characteristics of dairy capacity and what an animal inherits, we are bound to get into the study of blood also and there is very great danger of a breeder becoming so wrapped up in the history of the ancestors that he gets daffy on pedigree. The main thing is to breed cattle instead of a pedigree. The main problem is to use both and keep them in proper relation to each other. We are going to breed new record cows, get new standards. We shall be able to produce four or five hundred pound cows with as great a degree of certainty as we are now able to produce trotting horses with 2:30 speed. In holding the strong qualities of some of our herds and improving the weak points, some

Use Less Land

IT COSTS TOO MUCH to chase a crop all over ten acres of land when five acres will do the trick. Get ten acres' yield from five and save handling the extra land.

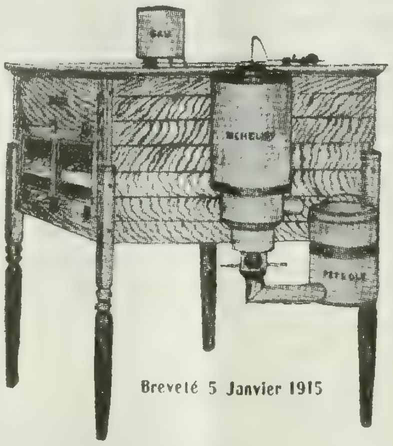
Bradley's Fertilizers

in connection with good farming, sensible rotation and occasional liming when necessary will help you do this. They furnish the available plant food for big crops, and bring them along quickly and improve their quality.

Prices should be good. The Breeder's Gazette says: "If there ever was a time when bumper yields were sought, it is *this year*". For this reason, use Bradley's quickly available fertilizers and get your big money crops in 1915. Crops won't have to wait for their plant food to become available.

Booklets and circulars mailed fre to any address. Drop a postal card to

The American Agricultural Chemical Co.,
92 State Street, Boston 2 Rector Street, New York
Buffalo, Philadelphia, Baltimore, Etc.



RICHELIEU INCUBATOR

Made in Canada of California Red Wood

Carefully Constructed.
Unlimited wear — perfect isolation.
Easy handling.
Positive mecanism.
Ultra sensible heat regulator.
Mechanical turning of eggs.
Sliding cheminey.
Automatic filling lamp.

WRITE FOR COMPLETE DESCRIPTION.

CANDLER eggs without taking them in your hands or moving them. A child can use the RICHELIEU EGG TESTER. By mail, $1.10.

Ask for our tested thermometer, $0.75.

Tables and caponizing tools, killing tools, hoppers, troughs, bands with numbers, etc., etc.

Apply to **Richelieu Incubator,** 30 to 40 Williams Street, St. Hyacinthe, Que

FOUND MONEY

Subscribers wishing to take up subscriptions for the

JOURNAL OF AGRICULTURE

in their respective localities are requested to write to the manager for terms and conditions.

of our men in the future may be inclined to consider the advisability in some cases of mating animals related to each other. Some have done this successfully in the past; others have not. Some have advised and others have discouraged it. Some think more about the pedigree than they do about the cattle. Others seem to be sacrificing the cattle to keep the pedigree from showing line breeding. Always keep in mind that we are breeding animals rather than pedigree but sometimes it is considered better to practice a little line breeding, if you konw how to do it properly, than to do otherwise. The idea, however, is not popular. Consider the elements of dairy capacity; breed cattle and not pedigree; use the pedigree in the right place and the rest will take care of itself.—Prof. F. R. Marshall, before the Ohio State Dairymen's Asso'n.

SHEEP RAISING

Every Farmer in the Country should have Sheep. Advantages of Sheep Raising

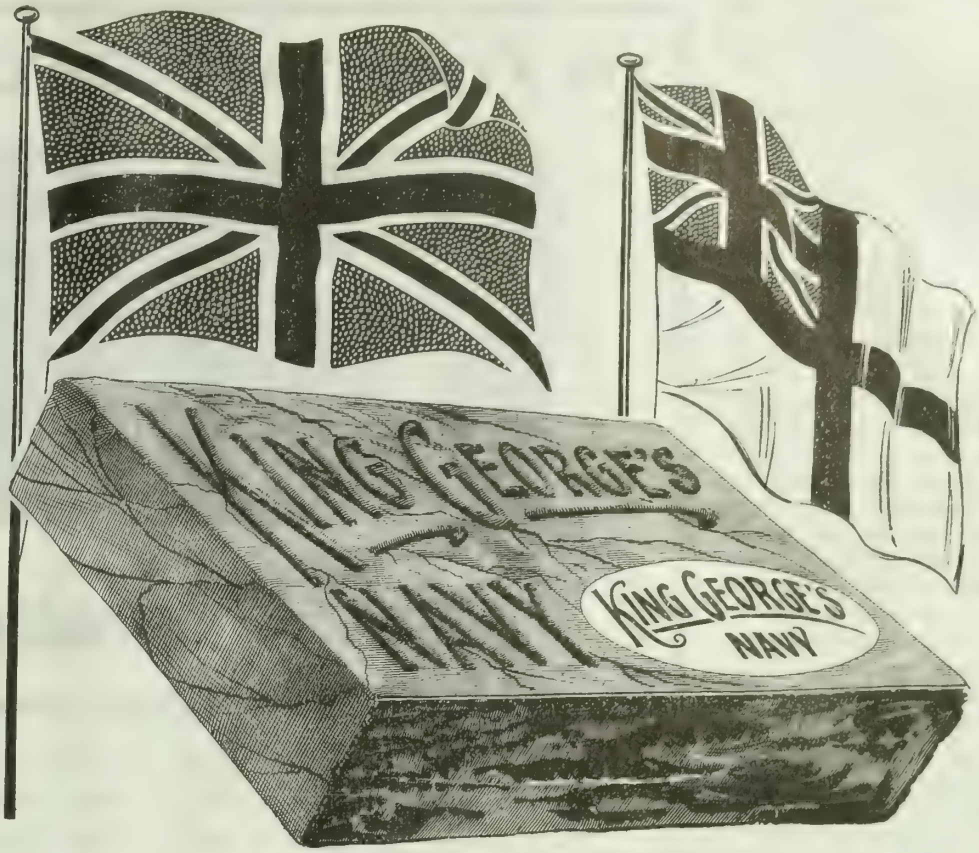
(From an Address at Guelph Winter Fair, by R. H. Harding)

We rightly hear a great deal today as to our duty to our country. I think the farmers of the Province of Ontario have a duty to perform altogether apart from sending their sons to the front and going to the war themselves. There is something else for us to do that is quite as important as protecting our shores, and that is providing the food supply for the armies at the front, and for the people of this country.

What do we find as far as the sheep industry of this country is concerned? We find that the farmers of this country are stampeded. We find that they are not keeping as many sheep as formerly; we have less than 1,000,000 sheep in Ontario to-day. We find that the decrease has been over 25,000 within the last year. This brings up the question, "are we as farmers doing our duty to our country?" Are we doing our duty to ourselves in allowing this state of affairs to continue? I think the man who does his duty to the country does his duty to himself.

We find that the decrease in sheep in four years is nearly 135,000. We might try to find out the reason for this shortage, but we have not time to go into that to-day. We have simply time to touch the fringe of this subject to find out whether we should right about face in the interests of this country and in our own interests as well and raise more sheep. We find that the price is not responsible for this condition of affairs. In 1900 the average price for sheep and lambs was $3.64 per hundred and last year the price was $6.20, nearly double what it was 13 years ago. I think the principal reason for the shortage in sheep is that the farmers of this country are running with the crowd. I heard it said a few years

(To continued on pages XII)



IRRESISTIBLE

King George's Navy Plug

TASTE THE LINGERING FLAVOR!

Enjoy the natural aroma and full rich flavor of the choice tobaccos retained by our own special process of manufacture.
You'll like it because it is rich and pleasant.

Made in Canada.

SOLD EVERYWHERE: 10c. A PLUG.

ROCK CITY TOBACCO CO., LIMITED, MANUFACTURERS. QUEBEC, CANADA.

Firm and gentle massage of the teats by natural atmospheric pressure. That's the Empire way. It makes even nervous cows give down quickly and in many cases even increases the milk yield. Costs less to install. Does the work perfectly from the start. Double or two-cow unit takes care of 20 to 30 cows per hour. One man can operate 2 double units.

EMPIRE MECHANICAL MILKER

Nearest to Nature

The secret is in the Empire Teat Cups. No compressed air used. There can be no chance of sore or inflamed teats or udders, as the massage is firm and natural, never harsh and quick.

Empire Cream Separator

The machine that has already helped put so many dairies on a paying basis. Easy to clean and operate and outdoes all others in results.

Let us send you full description and pictures of Empire Milkers and Empire Cream Separators that are making good in many fine dairies. Ask also for our offer on the Empire Sta-Rite Engines and Empire Feed Mills. Write for catalog. J

The Empire Cream Separator Company
of Canada, Limited
Toronto and Winnipeg

Hatching eggs and Rabbits

FOR SALE—Eggs from prized stock Golden Wyandottes, $1.50, a setting of 15, Barred Plymouth Rocks, $1.25, a setting of 15. Also big Giant Flanders and Norman Rabbits, weight from 12 to 15 lbs. C. BUSSIERES, No. 49, St. Bernard St., Quebec.

OUR S. C. Rhode Island Reds have won at the shows for eight years. May is the best month to hatch winter winners in. Try a setting this year. Satisfaction and a good hatch guaranteed. A T. WOODLEY, Knowlton, Que.

FOUND MONEY

SUBSCRIBERS WISHING TO TAKE UP SUBSCRIPTIONS FOR THE

JOURNAL OF AGRICULTURE

IN THEIR RESPECTIVE LOCALITIES ARE REQUESTED TO WRITE TO THE MANAGER FOR TERMS AND CONDITIONS.

ago that it was a good plan to run with the crowd, but I do not think that is working out well as far as the sheep industry is concerned.

It is just as necessary to develop this country and the meat supply of this country as it is to defend our shores, because by developing the country and by putting on the market a good supply of food products, we are doing the very best thing we can to defend our country from the enemy.

Need a Higher Standard

To the farmers of Ontario who are breeding sheep, I would say, raise your standards. Some farmers have first-class breeding stock, but there are a number who are easily satisfied in their foundation stock. Every farmer should aim to put on the market the very best that can be produced. He should se the best at this show and should produce nothing but the best. This show brings one farmer in rivalry with the other, and the farmers of Ontario should be in competition with each other in trying to produce the best.

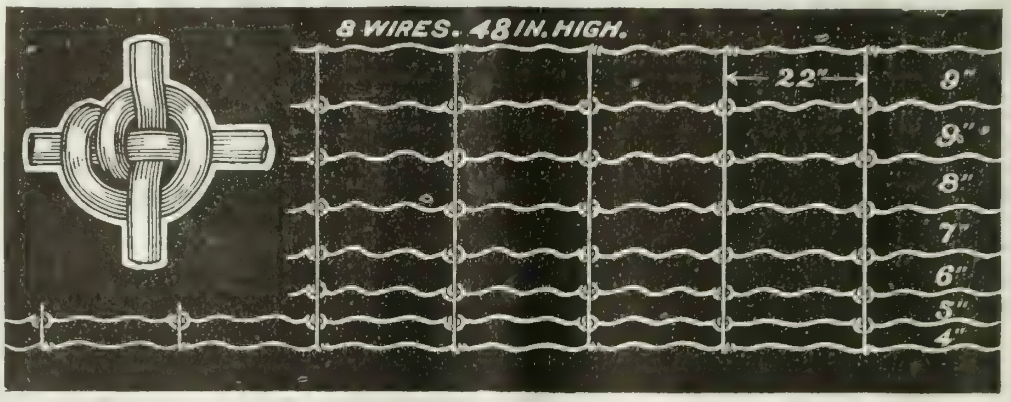
Every farmer in this country should be in the sheep business in a small way; every farmer should not go into sheep raising on a large scale, but every farmer should have a small flock of sheep on his farm. Why? First, because they are the greatest scavengers in the country and they will clean up more than 90 per cent. of the weeds that are worrying the farmers to-day. Second, they are one of the most profitable lines of stock to produce.

When you start into the sheep industry, do not be satisfied with anything that the drover wants to impose you. If you are not a judge of good stuff yourself, get somebody who is to help you select your foundation stock. Two or three really good sheep to start with are better than nine or ten scrubs. Get the proper start and you are sure to succeed. Don't let a few dollars stand in the way of securing first-class foundation stock. You should strive to get all the size, consistent with the quality from a mutton standpoint, that you can possibly get in the particular breed you desire to keep. I do not think the farmer who is breeding from a commercial standpoint should be satisfied with a small, undersized sheep simply because he will get him cheaper than a good one.

When we have this flock, it is necessary to give them better care than the average farmer is doing. We are not putting them on the market in proper shape. We should aim to put on the market a finished article. It is not possible to put lambs on the market in a very large way in midsummer and early fall and have them properly finished. If you want to market lambs in the fall, it is necessary to put them on some good clover or rape or feed them a light grain ration. I am of the opinion that the farmer can well afford to keep his lamps until mid-winter, because in doing that he will be accomplishing several things. He will be manufacturing the produce of his farm and will be putting on the market a finished article which nine cases out of ten will bring the top market price.

(To be continued)

THE FENCE THAT EVERY CANADIAN SHOULD BUY

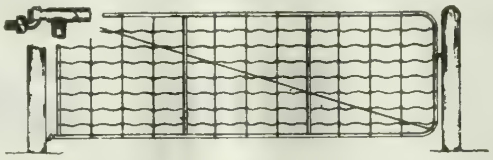


Invincible

FENCING and GATES.

Invincible Fencing is guaranteed to be made exclusively from Open Hearth Steel Wire and heavily Galvanized. The best quality of Steel obtainable for the manufacture of wire fencing.
Made entirely in Canada from the ore to the finished product.

By our Sales Method you see your fence, test it, and have an opportunity to stretch it before you pay for it.



Invincible Square Corner Gate. Absolutely the strongest and most serviceable gate on the market.

Write for your copy of our catalogue. It gives you good information of the wire fence situation, and we would be pleased to mail you a copy.

Special prices quoted on request.

Do Not Buy Any Fence Until You Write for our Proposition.

The STEEL COMPANY OF CANADA, Limited
1272 Notre Dame West, MONTREAL.

Redpath

SUGAR

The inherited preference

for Redpath Sugar that exists in so many thousands of Canadian homes to-day, is based on genuine satisfaction for three generations. Satisfaction first with "Ye Olde Sugar Loafe", made in Canada by John Redpath 60 years ago—then with Canada's first Granulated Sugar, made by the Redpath Refinery in 1880—now with the modern 2 lb. and 5 lb. Sealed Cartons of Redpath Extra Granulated—

Get Redpath Sugar in original packages—then you are sure of the genuine!

"Canada's favorite sugar, at its best"

CANADA SUGAR REFINING CO. LIMITED, . . MONTREAL.

122

UNIVERSITY OF ILLINOIS LIBRARY
JUN - 1915

The JOURNAL of AGRICULTURE

AND HORTICULTURE

Volume 18 *June 1st 1915* *Number 12*

Three Typical Representatives of Dr. Harwood's Holstein Herd forming a Judging Class for Senior Students of Macdonald College.

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

THE STOVE THAT HELPS YOU HURRY

WITH a NEW PERFECTION Oil Cookstove you don't have to wait for the fire to come up. Just scratch a match—the NEW PERFECTION lights instantly, like a gas stove. Your meal is prepared and on the table in no time.

A NEW PERFECTION in your kitchen means cool, comfortable cooking all summer. Made in 1, 2, 3 and 4 burner sizes. At hardware and department stores everywhere. If your dealer cannot supply you, write us direct.

ROYALITE OIL GIVES BEST RESULTS

NEW PERFECTION OIL COOK STOVES

"NOW SERVING 2,000,000 HOMES"

THE IMPERIAL OIL COMPANY
Limited

BRANCHES IN ALL CITIES

Made in Canada

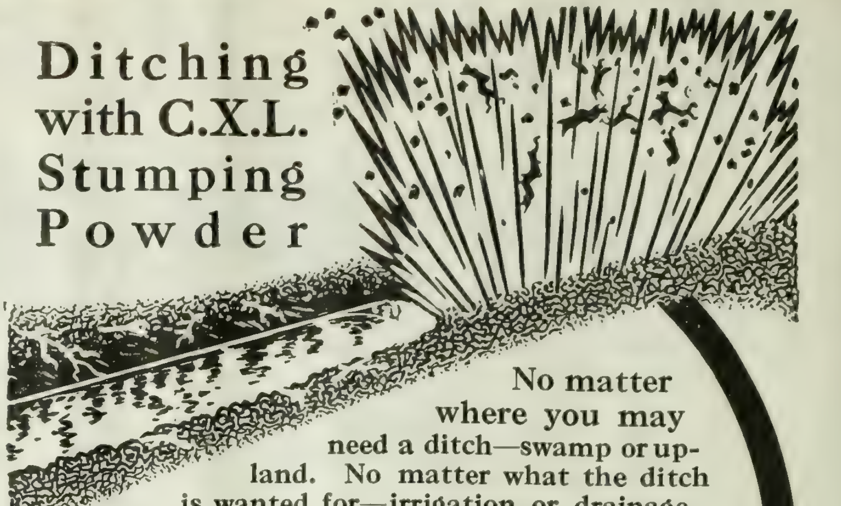
"Ye Old Sugar Loafe of 1854"
The Redpath Carton of Today

60 years ago Grandfather got an *individual* sugar package—"Ye Olde Sugar Loafe" made by John Redpath, in what was then Canada's *only* Sugar Refinery.

Now, at less than half the price, his granddaughter gets a much improved article, also *"individual"*—

Redpath

Extra Granulated Sugar
in Sealed Cartons and Cloth Bags
2-lb. and 5-lb. 10, 20, 50 and 100 lb.
"Canada's Favorite Sugar for three Generations"
CANADA SUGAR REFINING CO., LIMITED, MONTREAL.
128



Ditching with C.X.L. Stumping Powder

No matter where you may need a ditch—swamp or upland. No matter what the ditch is wanted for—irrigation or drainage—C.X.L. Stumping Powder will dig it cheaper, quicker and with less labor than is possible by any other method. The only labor necessary is in placing the C.X.L. Stumping Cartridges and firing them.

Send for our Free Book, "Farming with Dynamite"—it tells all about blasting ditches, planting trees, blowing out stumps and boulders, sub-soiling, and other ways to profitably use C.X.L. Stumping Powder. Safe as gunpowder.

Big money for you in Agricultural Blasting.
Write for Proposition.

Canadian Explosives Limited
802 Transportation Building
Montreal
Western Office, Victoria, B.C.

CANADIAN EXPLOSIVES LIMITED TRADE CXL MARK

Stop That Scratching!

Pratts Poultry Remedies
Pratts Poultry Regulator, 25c.-$9.
Pratts Baby Chick Food, 25c. to $5.75.
Pratts Liquid Lice Killer, 35c. qt., $1.00 gal.
Pratts Powdered Lice Killer, 25c.-50c.
Pratts Roup Remedy, 25c.-50c.
Pratts Roup Tablets, 25c.-50c.
Pratts White Diarrhœa Remedy, 25c.-50c.
Pratts Cholera Remedy, 25c.-50c.
Pratts Head Lice Ointment, 25c.
Pratts Gape Remedy, 25c.-50c.
Pratts Bronchitis Remedy, 25c.-50c.
Pratts Condition Tablets, 25c.-50c.
Pratts Sore Head Remedy, 25c.-50c.
Pratts Scaly Leg Remedy, 25c.-50c.

Scratch—scratch—scratch—scratch. Is it any wonder that the poor lice-bitten hen is on the verge of prostration through the continuous, tormenting itching? No need to look for eggs. No hen can do her duty under such conditions.

But use

Pratts Powdered Lice Killer

and note how all lice and itching quickly disappears, and how with the return to normal, regular egg-laying commences again. Also destroys insects on dogs, plants and flowers. Sifter top cans, 25c. and 50c.

Pratts Poultry Regulator

will make your hens lay. A mild natural tonic for the digestion and egg production, it prevents disease and ensures more eggs.

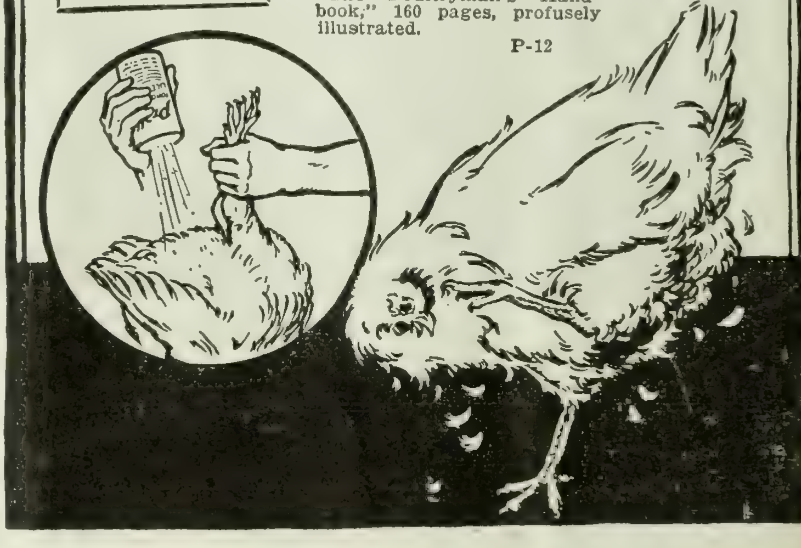
"Your money back if not satisfied."

25-lb. pail, $2.50; 100-lb. bag, $9.00. Also in packages at 25c., 50c. and $1.00. At your dealer's.

PRATT FOOD CO. OF CANADA, LIMITED,
Dept. 8 Toronto.

Write your name and address on the margin of this ad, tear it out and mail it with 10c. (stamps or silver), to cover postage, wrapping, etc., and we will send you a copy of "The Poultryman's Handbook," 160 pages, profusely illustrated.

P-12



ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE
AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 99,695
ENGLISH, 9,820
FRENCH, 89,875

Volume 18
JUNE 1st 1915
Number 12

EDITORIAL

To the Secretaries of Agricultural Societies and Clubs

LISTS OF SUBSCRIBERS TO THE JOURNAL OF AGRICULTURE

IMPORTANT NOTICE

TO prevent any irregularity in the delivery of the "Journal of Agriculture" to the members of Agriculture Societies and Clubs, you are earnestly requested to inform us as soon as possible of the changes occurring this year among the members on your respective lists; that is to say, the names and addresses to be added or left out.

Until you inform us of these changes the Journal will be distributed according to the old list of subscribers.

The list of the names to be added or cut out must be forwarded before the coming month of July, the date of the next subscription year of this Journal, to Mr. OSCAR LESSARD, Sec., Council of Agriculture, Dept. of Agriculture, Quebec.

AGRICULTURAL MERIT COMPETITION FOR 1915

District No. 1.—Official Notice

THE Agricultural Merit Competition will take place this year in District No. 1 of this province, including the following counties:—Jacques Cartier, Hochelaga, Laval, Two Mountains, Soulanges, Vaudreuil, and the parishes and townships of Argenteuil and Terrebonne counties which are not included in the Laurentides.

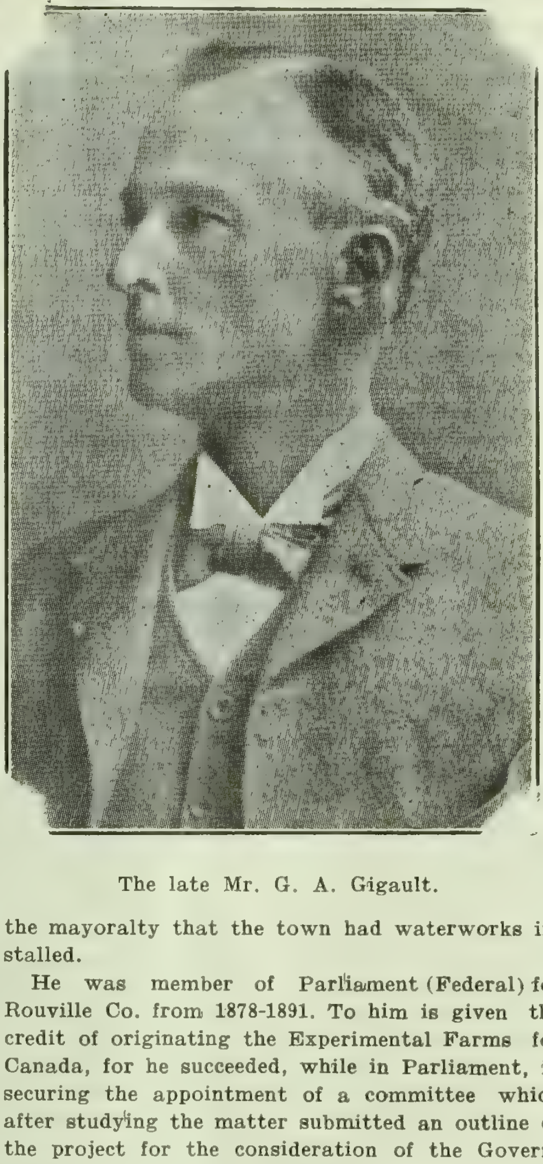
Farmers wishing to take part in this competition may make application to the Minister of Agriculture, Quebec, from now up to the 15th June at the latest, on forms to be supplied by the Minister for that purpose.

No applications received later than June 15th will be considered.

Winners in this district of the Silver Medal and the diploma of Very Great Merit in 1910 are reminded that they have the right to compete this year for the Gold Medal and the Diploma of Highest Merit.

THE DEATH OF MR. G. A. GIGAULT

IT is with feelings of profound regret that the "Journal of Agriculture" announces the death of Mr. G. A. Gigault, Deputy Minister of Agriculture, which sad event occurred on April 25th at his home at St. Foye, Quebec. In his passing the province of Quebec loses a most upright, efficient and progressive official.



The late Mr. G. A. Gigault.

The late Mr. Gigault was born in St. Matthew's, 1845, and was educated at the St. Hyacinthe College. He was successively post master and mayor of St. Cesaire, and it was while he occupied the mayoralty that the town had waterworks installed.

He was member of Parliament (Federal) for Rouville Co. from 1878-1891. To him is given the credit of originating the Experimental Farms for Canada, for he succeeded, while in Parliament, in securing the appointment of a committee which after studying the matter submitted an outline of the project for the consideration of the Government.

Mr. Gigault's claim for remembrance, however, rests rather on the excellent progressive work he accomplished during his long tenure of office as Assistant Commissioner or Deputy Minister of Agriculture from 1892 to the present—twenty-three years.

Always open-minded and ready to receive suggestions, Mr. Gigault was unusually well-informed regarding the most recent advances in agriculture. He travelled extensively in Europe for the purpose of informing himself on the dairy and agricultural industries of Denmark, the British Isles, Belgium and France with the view of promoting those industries in Quebec. He also travelled through Canada and the States to look into the co-operative movement, in which he took a very keen interest. Through his activity the co-operative Societies and the Cheese and Butter Societies were formed. In fact one can hardly mention any of the progressive departures in agricultural legislation in this province during the last twenty years that do not bear the strong impress of Mr. Gigault's constructive leadership.

UPWARD TREND OF MARKET PRICES OF FARM PRODUCE

MAY showed a decidedly upward turn in the market prices of most farm products, and we may with confidence expect that from now onward the prices will continue to rise. The disturbance and waste due to the war are now visibly affecting the markets, and the demand for horses, cattle, sheep, swine and dairy products is greater now than at any time since the opening of hostilities. The abnormal conditions at the outbreak of the war, owing to the unsettling of the markets, to the uncertainty of employment on the part of thousands of consumers, and to the financial depression of the previous year, caused a fall in the prices of nearly all farm products. This fall, coupled with the rise of feeds due to the poor harvest of 1914, made it impossible for stock feeders to prepare their stock for the market. As a result thousands of stockers and feeders were sold last fall and the market prices went down still further.

It is to be expected that abnormal conditions of another type are now setting in and that farmers will get good returns for products offered on the market. The warring countries used, at the outset, food supplies that were most available, namely those at or near home. These, however, have become much reduced and Europe is now looking abroad for future supplies of cattle and hogs. The horse market all along has been very dull, but considerable buying has been done lately and from now on there is likely to be an increasing demand for army horses.

The high price of cheese this season will undoubtedly stimulate greater production of this article of diet. Of late years in many districts a large quantity of milk and cream was diverted to the States, but much of this will now be sent to the cheese factory or butter factory.

A DANGER IN SCHOOL FAIRS

ONE of the recent developments in agricultural education is the School Fair. In many of the States and in Ontario it has taken a strong hold not only on the pupils but also on the parents, with the result that the attendance at the School Fairs in the autumn exceeds in many cases that of the Township Fairs.

Under careful guidance the School Fair may be made to serve a most useful purpose educationally. Commendable interest is aroused among the pupils in things that pertain to the farm. Plants

CONTENTS

EDITORIAL. — Lists of Subscribers.—Agricultural Merit Competition.—The Death of Mr. G. A. Gigault.—Upward Trend of Market Prices.—A Danger in School Fairs.—The Season's Crops.—Agricultural Instruction in Rural Schools.—Notes. —New B.S.A's from Macdonald College.

ORCHARD AND GARDEN.—Orchard Insects 1915.—Orchard Demonstrations. — Co-operative Sales of Maple Products. — Intercropping young Orchards.—Cutworms killed by the use of Poison.—Foul Brood of Bees.

FARM AND FARM CROPS.—The Bugle Blast to Canada.—Will Nitro-cultures benefit non-leguminous Crops?—District of Bedford Notes.—The Spring Outlook in Richmond County.—Agricultural Conditions in Huntingdon County.—Sherbrooke County Agricultural Society. — Farm Weeds (cont.).—Cultivation for Corn.—The Seed Law.—Weed Seeds in Soils.—The Story of an Inquiry.—Locusts in Eastern Canada.—When Soils need lime.

LIVE STOCK.—Summer Feed for Dairy Cows. —Pork produced cheaply on Pasture. — Wool Growers' and Sheep Breeders' Associations.—District of Bedford Wool Growers' and Sheep Breeders' Association. — Molasses for Dairy Cattle. — How to erect small Concrete Buildings.—The Ox Warble. — Condimental Stockfeeds.

DAIRY. — Farm Milk Prices in the United States.—Some Differences. — Benefits of Keeping Milk-records.

POULTRY. -- Demonstration Poultry Houses.—Feed Chicks lightly. — Rearing the young Stock.—Poultry Genetics.

WOMAN'S WORLD. — Dunham's Home-makers' Club. — Prevention of Moth Damage.—Foods and Food Preparation (cont.).—The Home-makers' Club and the Rural School.—The Children's Homer (cont.).

GENERAL INTEREST. — Artificial Silk. — Length of Life in Bees. — Continuation Schools in Farming. — Care of the Wood Lot.—The Farmer's Income.—Application and Care of Farm Manures.

Index July 1914 to June 1915 inclusive.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

and animals are grown and cared for under the supervision of a competent instructor, and much information of a valuable nature is obtained by the pupils during the season of growth. The importance of good seed, careful cultivation of the soil, and proper care of the growing plants against enemies and drought, is brought to the attention of the youthful experimenters in such a vivid manner that the practical application of the measures employed to farm practice becomes evident.

If this work forms part of the school effort, and proper means are taken to use the materials in an educational way, the training of the pupils in observation and in reasoning from cause to effect, the project becomes a thing of great value. If, however, the pupils are given certain things to grow with the main object of competition for a prize at a school fair in the autum, much harm may result. Great interest will undoubtedly be aroused, but the danger lies in the effect of the competition. Reports have already reached us from certain sections in Ontario that the rivalry among pupils and among adjacent schools was so keen that the whole scheme seems fair to defeat its real purpose. Parents were so anxious to have their children win that they were known in some cases to put in an exhibit in their children's name! What more debasing influence could be introduced among youthful impressionable minds than this kind of work! Surely this is not a suitable preparation for coming citizens in civic morality.

We hope the introduction of school fairs into Quebec will be attended by better methods and better results. Only so long as the educational factor is kept distinctly in the foreground and the prize element eliminated as far as possible, will it be possible to make school fairs a most valuable feature in agricultural education.

THE SEASON'S CROPS

IT is of course too early to predict with any degree of certainty how the crops will harvest. The farmer in his season's operations has to deal with many factors of uncertain nature and beyond his control, such as hurricanes, hail, lightning, drought, flood, frost, etc. He must necessarily trust to Providence for escape from these. The manufacturer is not dependent upon such factors, his only troublesome and slippery factor being the market

Whatever the harvest may be, and we fervently trust that it will be a large one this year, the season started off very auspiciously at any rate. Vegetation was fully 12 to 14 days ahead of last year in most sections. Pastures and meadows are in excellent condition, and there is good prospects of a large hay crop.

The seeding season was almost ideal for those farmers who were in a position to take advantage of it, and a larger acreage than usual was planted.

AGRICULTURAL INSTRUCTION IN RURAL SCHOOLS

THAT the Protestant Committee of Public Instruction are in earnest regarding the introduction of instruction in agriculture into the rural schools of Quebec is evident. All the rural inspectors recently spent a week at Macdonald College as the guests of the College and observed at first hand the nature of the work that is being carried on there. They not only visited the various departments but also listened to lectures by the professors in charge of these departments with the object of learning how the instruction given at the College might be linked up with the work in the rural schools. They also attended a course of eleven lectures given by Dr. Hamilton on "Nature Study and Elementary Agriculture" in which the syllabus of studies of these subjects was gone over carefully and the best methods of teaching these newer subjects in the different grades were thoroughly discussed.

We believe that this visit of the inspectors to the college will be looked upon in later days as an *epochal* event. It means the dawn of a new and brighter day for the rural schools. The pupils will henceforth receive instruction in those very things which have been omitted in the past. The school, it seems to us, should be a place of preparation of the *majority* of the pupils for life's duties and responsibilities *on the farms*. We cannot expect the young people on leaving school to remain on the farms if they have no special interest in the things of the farm. The newer studies, if properly directed, should not only furnish this much needed interest in rural life, but also be a valuable means of mental training.

Leaders in educational matters have too long been under the impression that cultural training was everything and could best be secured through a study of the classics and mathematics and other old-time subjects. This idea, however, is being rapidly dispelled through the fine work of the technical schools and colleges where many of our most cultured and useful men and women have been trained. *Life for service* is the underlying idea of the newer studies, and the course of studies in schools should be adapted to the probable life-work of the majority of the pupils—not for the small minority who may wish to go to the University and into the professions.

We believe our position in this matter is in harmony with the general trend of modern education.

If the new movement in Quebec is to be a success not only the Protestant Committee but the inspectors of schools must be in hearty sympathy with it and give it every encouragement. In addition, there must be a competent body of trained teachers in the newer subjects. In time these will be forthcoming if the inducements are sufficiently tempting. Meanwhile we await with interest the outcome of a movement which means so much to the whole country.

NOTES

THE garden that is well kept in June will require little labour in the later summer other than that involved in harvesting the crop.

⁂

The Hon. Mr Caron, Minister of Agriculture, will continue this year the policy of having drainage plans prepared by agricultural college experts free of charge. Farmers who desire to take advantage of this opportunity should make application to the Department as early as possible. Applications should be addressed to Mr. J. Antonio Grenier, Secretary, Department of Agriculture, Quebec.

⁂

Mr. J. B. C. Trudel, Provincial Superintendent of cow testing, reports that there are now over 600 farms in the province keeping records of production and cost of feed for from 5000 to 6000 cows.

⁂

The response of our farmers to the appeal of the provincial branch of the Red Cross Society for gifts of maple syrup and sugar has been most gratifying. A first shipment of 800 gallons of syrup and 1200 lbs of sugar to the Duchess of Connaught hospital at Clivedon was made early in May. On May 20th a supplementary shipment of 120 gallons of syrup and 100 lbs of sugar was sent to England and a similar one to Boulogne, France.

⁂

The satisfaction of imagining how the treat will be appreciated by Canadian soldiers in the hospital

THE GARDEN AND ORCHARD

ORCHARD INSECTS, 1915

DURING a recent series of meetings many apple orchards in various parts of the province were visited and from evidence there gathered this season gives promise of having the usual number of insects and diseases.

Tent Caterpillars are still plentiful in many sections but in other sections they have ceased to be very troublesome or have disappeared altogether. Fruit-growers in general have less difficulty in controlling them than formerly due to the fact that they are better acquainted with the means for their destruction.

The bud-moth has long been a serious pest, although not as well known as the tent-caterpillar. Many orchards were visited in which it was difficult to find a bud without a bud-moth worm. The second spray (1) if applied at the right time will undoubtedly destroy practically all of the bud moth worms.

The cigar case-bearer is somewhat similar to the bud-moth in its method of attacking the buds, but it is not quite such a serious pest. It is largely controlled by the second spray. (1)

Aphids or plant lice give promise of being much more serious than they have been for years, and are already doing much damage. After the leaves

---

is no doubt all the reward the donors would have asked. But many of our readers will have already received with pleasure the handsome illuminated "appreciation" issued by the Red Cross Society to the donors of maple products. Any one with artistic tastes would gladly give a gallon of syrup for such a beautiful diploma. About 800 of these asknowledgments have been sent out and the Society still has a good supply for those who send in their gifts of maple sugar and syrup late. We ought perhaps to mention that neither these diplomas nor any of the expenses connected with them are paid for out of the Red Cross Funds. The Society received a special gift for this purpose.

* * *

The Quebec Cheesemakers' Co-operative Society has moved into larger quarters at 61-63 William Street, Montreal. In addition to butter and cheese the Society is now handling eggs and maple products,

* * *

The Provincial Government has authorised the Department of Colonisation, Mines and Fisheries, to issue permits for the establishment of farms for the breeding of fur-bearing animals. The Department reserves the right to prohibit the sale of these animals for export. The proprietors of the farms are required to furnish all the information necessary for the compilation of statistics relating to the development of the fur-farming industry.

NEW B. S. A.'S. FROM MACDONALD COLLEGE

May 12th 1915

THE following Students have completed their fourth year and have been granted the degree of Bachelor of Science in Agriculture by McGill University:

(Names in Alphabetical order.)

Boyce, G. C., Athelstan, Que., in Animal Husbandry Course;
Durling, V. B., Lawrenceville, N. S., in Cereal Husbandry Course;
Evans, H. T., Hampton, N. B., in General Course;
Hodgins, E. L., Portage du Fort, Que., in Animal Husbandry Course;
King, J. H., Sussex, N.B., in General Course;
McCormick, J. H., Barbados, B.W.I., in Biology Selective Course;
McKechnie, R.E., Wyman, Que., in General Course;
MacDougall, W. G., Tatehurst, Que., in General Course;
McOuat, J. E., Lachute, Que., in General Course;
McOuat, L. C., St. Andrews East, Que., in Animal Husbandry Course;
Mitchell, W. D., Drummondville, Que., in General Course;
Presley, F. Y., Malden, Mass., in Selective Course;
Ricker, E. M., Malden, Mass., in Horticulture Course;
Roy, H. B., Sabrevois, Que., in Horticulture Course;
Russell, C., New York City, U.S.A., in Animal Husbandry Course;
Sadler, W., Macdonald College, Que., in Bacteriology Selective;
Taylor, A. G., Dewittville, Que., in Animal Husbandry Course;
Westbrook, L. J., Morganville, N. Y., in Animal Husbandry Course;
Williamson H. F., Ste-Anne de Bellevue, Que., in Poulty Selective Course;

The John Dougall Medal was won by W. Sadler and the Sir Edward Stern Challenge Cup by L. C. McOuat.

NEW B. S. A.'S.—The 1915 Graduating Class at Macdonald College.—Reading from left to right back row are: W. Sadler, L. J. Westbrook, H. I. Evans, R. E. McKechnie, J. H. Ross, E. Grove-White, F. Y. Presley, E. L. Hodgins, C. Russell, H. B. Roy.
In the second row, seated, are: J. E. McOuat, L.C. McOuat, A. G. Taylor, E. M. Ricker (President), H. D. Mitchell, H. J. McCormick, G. C. Boyce.
In front row are: J. H. King and H. F. Williamson.

become badly affected it is practically impossible to destroy them by spraying as they cause the leaves to curl up, and as they remain on the inside spray will not reach them. Where the three sprays (1) of lime sulphur solution are given little trouble should be experienced from this pest, but where these are not given "black leaf 40" diluted 1-3 pint to 40 gals. of water will destroy them. Whale oil soap or kerosene emulsion may also be used. Black leaf 40 can be obtained from any seed firm.

Oyster-shell bark-louse is very prevalent in many orchards and some trees are thoroughly encrusted with it. The dormant spray of lime-sulphur should keep the trees comparatively free from it.

The codling moth eggs will be deposited in the calyces of the apples shortly after the trees have finished blooming, which is the only time that spraying will destroy this pest. This spraying is the third one, and should consist of lime-sulphur and arsenate of lead.

Apple scab is particularly bad in damp or rainy seasons, and judging from the weather during the past two weeks, scab should have favourable weather conditions for its rapid development this season. Last year there was little scab even in unsprayed orchards and many growers think they will be free from it this year. However, one cannot rely on this, and the only safe way is to spray and spray thoroughly.

The apple-tree canker is one of the worst fungous diseases in the orchard and causes the death of many limbs and branches and sometimes whole trees. Very often the cause of the death of trees is attributed to winter injury when as a matter of fact it is this disease which can be kept in check by spraying and the cutting out and burning of diseased limbs. Very little canker is found in well sprayed orchards.

T. G. BUNTING,

(1). The April and May issues of the Journal give fuller directions as to the different sprayings required in an apple orchard.

ORCHARD DEMONSTRATIONS

EIGHTEEN orchard demonstrations in pruning and spraying were held by the Horticultural department of Macdonald College in co-operation with the college demonstrators during the past few weeks. These demonstrations were all held in orchards located at the various places visited. Instruction in pruning as well as a pruning demonstration was given, after which the "home-made concentrated lime sulphur" solution was made, duly tested with the hydrometer and the proper dilution made. The diluted solution was then applied to the trees to show the right method of application. Pruning and spraying were the chief phases of orchard work dealt with but in addition a general talk in which selection of varieties, preparation of the land, planting, intercropping, manuring, etc., were discussed as fully as time would permit.

One of the most interesting phases of the work was the discussion of orchard pests, both insect and fungous, and it was frequently observed that the only insects heretofore sprayed for were the caterpillar and codling moth.

In many places, depending on the apple trees, it was possible to point out and show the interested spectators at least half a dozen serious orchard pests. The following were quite common and doing serious damage in most orchards: caterpillars, bud moth, cigar case-bearer, aphids, oyster-shell bark-louse, and apple-tree canker; also the apple scab was undoubtedly developing but had not yet made its outward appearance on the foliage, and of course it was too early for the codling moth, railroad worm and some other lesser pests.

Certain stages in the life history of these orchard pests were discussed and means of their control. This information has already been given in the two previous issues of the Journal and will not now be repeated.

The following is a list of places where meetings were held and the number of people in attendance:

Meetings attended by Prof. T. G. Bunting and A. E. Raymond:—	
Scotstown	35.
Sawyerville	12.
By Prof. T. G. Bunting and V. B. Durling:—	
Lachute	5.
Calumet	13.
By Prof. T. G. Bunting and R. E. Husk:—	
Hemmingford	15.
Valleyfield	10.
By Prof. T.G. Bunting and W.G. MacDougall:—	
Sherbrooke	6.
Compton	14.
By A.C. Gorham and A.F. Emberley:—	
Magog	15.
Way's Mills	3.
Beebe Junction	16.
Dixville	14.
By A.C. Gorham and C. H. Hodge:—	
Danville	16.
Melboro	15.
Gore	12.
Denison's Mills	15.
By A.C. Gorham and E.A. Lods:—	
Sweetsburg	40
Cowansville	14.
Total attendance of	270.

T. G. BUNTING

CO-OPERATIVE SALES OF MAPLE PRODUCTS

THE spirit of co-operation is gaining ground, and the number of successful co-operative enterprises is increasing year after year. In the marketing of dairy products, fruits, wool and eggs the co-operative system has brought most gratifying results, benefiting both producer and consumer. The Pure Maple Sugar and Syrup Co-operative Agricultural Association has been largely occupied hitherto in its campaign for revised legislation against adulteration and in the endeavour to improve the methods of production and consequently the quality of the maple products. The marketing side of the industry has, however, not been entirely neglected.

This year shortly before the opening of the season an arrangement was made with the Co-operative Cheesemakers' Association for the handling of the surplus output of the members of the Maple Sugar and Syrup Association by the former at its warehouse at 27 William Street, Montreal, on a commission basis.

Although the enterprise was a new one for the Cheesemakers' Association and its arrangements with the grocery trade had to be made on very short notice, the business was handled in an able manner and the returns to the producers were very satisfactory. On April 24th a representative of the Journal called on Mr. Auguste Trudel, the able manager of the Cheesemakers' Association and obtained from him the following figures representing approximately the trade in maple products up to that date: —

Maple syrup sold, 4000 gallons.
Prices, No. 1, $1.15; No. 2, $1.05; No. 3, $1.00.
Maple sugar sold, 13000 lbs.
Prices, No. 1, 10½ cents; No. 2, 10 cents.

INTERCROPPING YOUNG ORCHARDS

Extract from an address delivered at the last annual convention of the Quebec Pomological Society

BEFORE going into the details of intercropping the young orchard, I wish it understood that I would not crop close to the young trees. A strip at least three feet wide on each side of the row should be left free of the intercrop, and each year as the tree grows this strip should be widened.

There are two types of orchard men: First, the farmer who tills many acres and adds the orchard as another source of revenue, and second, the man who tills but a few acres of land, most of which will eventually be bearing. This latter type is more frequently seen in Ontario than in Quebec, but indications point to its becoming more common in certain sections of this province.

The need of intercropping brings out two points: The need of money and the need of cultivation. Few of us can afford to plant an orchard and wait without any returns until our orchard begins to bear. Any man is fortunate indeed who can do so, but still we find that where we can do this other things may arise, which would cause us to forget cultivation. Cultivation is one thing in orchard growing that cannot be neglected. We must take a leaf out of the market gardener's book, who has found that he must till the soil if he wishes returns. An orchard is a long period investment; therefore we can afford to take no chances. Cultivate we must, and this comes easier through intercropping because we get immediate returns.

But before we get too deeply into growing crops in the orchard we must think of how we will dispose of them. It is easy to raise most crops, but often difficult to dispose of them. The owner of a big farm, who raises cattle or sells milk, can raise crops with which to feed these animals. But the man on the smaller area must look abroad. His market may be either the town or city, or the canning factories. Of these latter we do not find many here in Quebec, so that necessarily our market must be the town or city.

There are certain characteristics of a good intercrop which we must consider: It must be profitable: It must need cultivation: It should not be a crop which requires stirring of the soil during the months of August and September, as we wish the young growth to be well hardened before winter: It should have different food requirements: It should have a different season of growth. There is not enough moisture in the spring for two crops, so let the tree have the use of the soil in spring: It is best to be an annual crop.

Bearing these points in mind, I would like to give a table of crops as they may be placed in three groups—good, bad, indifferent.

Good — Beans, cabbage, tobacco, potatoes, onions, squash, tomatoes, corn, buckwheat, carrots, peas, chickens.

Bad—Raspberries, blackberries, hay, grains.

Indifferent—Currants, gooseberries, strawberries.

A. H. MACLENNAN,

Macdonald College

CUT WORMS KILLED BY USE OF POISON

THE cut worm will get your garden truck if you don't watch out. If you haven't fall plowed, you may successfully fight the pests by the use of poison.

A slightly different formula from the old-fashioned poisoned bran mash was found very effective against grass-hoppers in Kansas in 1912. In 1914 this mixture was very successfully used against crickets, army worms and cut worms.

The formula for the Kansas mixture is as follows: Bran, 1 lb.; Paris green, 1 oz.; syrup, ¼ pt.; orange or lemon, ¼ of; water, 1½ pts.

Mix the bran and Paris green separately while dry. Squeeze the juice of the orange or lemon into the water, grating the peeling and pulp, and adding this also to the water. Dissolve the syrup in

THE FARM AND FARM CROPS

THE BUGLE BLAST TO CANADA

READERS of the newspapers and followers of the course of the war must long ago have become convinced that the situation grows more and more intense and critical day by day. Great Britain is faced not alone by outside enemies, but by labor troubles and by lack of those immense internal resources in the matter of food production that Germany and Austria-Hungary possess. She cannot feed herself, and is compelled to rely largely on other countries for a supply of the necessaries of life. In such case the duty of her children is distinctly plain. It is noteworthy of her enemies that they are not only thoroughly united but that they are enduring with what fortitude they possess the rigid military enforcements that are placed upon them for the conservation both of food and material. Every man, woman and child, from the Kaiser down, have been put on rations. The idea is three-fold, to guard against any possible emergencies, to mislead the foe into over-confidence and by thoroughness to bring such pressure to bear as will hasten the final decision. Britain is pursuing the same course. She has not yet found it necessary to place her population individually on short rations, but she has found it desirable to take over munition factories in order to ensure supplies that mean either life or death to the nation. Meantime, Germany by cowardly submarine assassination is endeavoring to starve her people and cripple her resources.

With such a state of affairs existent it is hardly necessary to explain to stay-at-home Canadians how best they can fulfill their manifest duty and show the burden-bearers how completely they possess their sympathy. But the bugle blast has its rallying power in peace as in war. To all the people, and to farmers, breeders and settlers in particular, the Patriotism and Production movement that is in progress is blowing its bugle, or, in other words, carrying its message. Its object is to arouse all and sundry to the part they are called on to play. That part does not of necessity mean harder work nor increased acreage; but it does imply the exercise of every faculty in attention and vigilance. It does imply in order to secure increased and improved production, by which alone cultivators of the soil can contribute towards the credit of the country and empire, the greatest care in the selection of seed, in the breeding of livestock and in economy of the land.

WILL NITRO CULTURES BENEFIT NON-LEGUMINOUS CROPS?

IT is a well known fact that leguminous crops grown from inoculated seed are superior to crops grown without the assistance of the nitro bacteria. Most farmers know that the bacteria found in the nodules on the roots of the legumes have the property to assimilate nitrogen from the air and this nitrogen procured without any expense is gathered in the plants. Part of it, often the larger part, remains in the soil and stimulates the development of following crops.

However, the benefit of an inoculated leguminous crop does not end there and the consequences are much more far reaching. Besides the nodule bacteria we find in the soil other organisms which can assimilate nitrogen from the air even in the absence of any vegetation. These organisms are called azotobacter and are found in small quantities in all soils. Their beneficial action is only nominal, but after an inoculated leguminous crop has been grown in a field we find there a considerable accumulation of azotobacter organisms, which have helped to increase the fertility of the soil.

These azotobacter bacteria will persist for a certain length of time after the leguminous crop has been harvested, and in that way they will continue to produce nitrogen for following crops. If such a following crop were able to support these bacteria with suitable food, they might persist indefinitely in large numbers and the problem of producing nitrogen for non-leguminous crops would be solved. However, we are unable to pro-

---

this mixture and wet the poisoned bran, stirring thoroghly. This mash is scattered around the infested areas.

FOUL BROOD OF BEES

BEES fortunately are not subject to very many diseases of a fatal nature. In comparison with other classes of live stock nature has been lenient with the honey bees. Bee-keepers in this country have only two serious diseases to contend with, both known under the general term of *Foul Brood* and classified respectfully as American and European. In nature they are, as the general term indicates, both brood diseases, i. e. they attack the young bees while they are still in the larval state before they emerge from their cells. In the course of time as the disease progresses so many of the larvae are attacked that there are not enough young bees to carry on the work of the hive which shortly after becomes extinct. European Foul Brood, as its name indicates, was first discovered and classified in Europe whence it made its first appearance in the new world in New York state quite a few years ago. Thence it has spread over many sections of the United States and Canada. American Foul Brood in this country seems to be more widely scattered and more virulent than the other form.

American Foul Brood will first be noticed as a rule because of the sunken, perforated, cappings of the larvae (larva is the name applied to that stage of a bee's developement when it appears to be a glistening, white, grub or worm partly filling the cell in which it has developed from the egg). On opening these cells it will be found that the larvae instead of presenting the glistening white appearance above referred to will be of a dull, brownish shade, the shade of brown varying according to the length of time the disease has progressed. If a tooth-pick is inserted into the larva, the broken skin will be found to be of a ropy consistency and will stretch out nearly an inch on being withdrawn from the cell as it is quite elastic. In odor the decayed mass will be strongly suggestive of a cabinet makers' glue-pot, and in advanced stages this odor will be plainly distinguished on removing the cover of the hive. Finally this dark-brown mass of matter which was once a larva dries up in the bottom of the cell in the shape of fine, small, scales which stick very lightly. As a general rule American Foul Brood attacks the larva after the cell has been capped. This disease is destructive among both black and Italian bees.

European Foul Brood differs from the American form as follows: The larva turn yellow first before assuming the brown shade, and at the very outbreak of the disease will sometimes have a small yellow spot on it. Victims of European Foul Brood are attacked as a general rule before the cell has been capped. Instead of the glue-pot odor this foul brood smells quite musty or sour and it will not rope more than about an eight of an inch. During a strong honey flow it will seem to disappear almost entirely to break out again with renewed energy as soon as the bulk of the honey flow is done with. European Foul Brood is extremely destructive to black bees and will exterminate a colony more quickly apparently than will the American type. Italian bees, especially some strains of them, seem to be very nearly immune, and in some cases cures have been accomplished by simply Italianizing and replacing black queens with Italian ones.

The treatments for these two forms of disease are the same. After having ascertained that a colony is affected proceed as follows. Prepare two or three frames with narrow strips of foundation, i. e. starters. Then in the evening or at some time when bees from surrounding colonies are not flying proceed to shake the bees from their old combs at the front of their hive and replace the old combs with the frames with starters. In the case of black bees it is a good plan to cage their queen at the time of shaking as they will sometimes show a disposition to swarm out after having been deprived of their brood. If there is a light honey flow on leave the bees on the starters for four days or if a heavy flow is on two days would be enough. At the end of this time, after they have used up the honey they brought with them from their old hive, shake them again on to a clean set of frames filled with full sheets of foundation, or else with generous starters and the cure should be complete. In the case of treating black bees for European Foul Brood it is necessary to Italianize, replacing the black queen with an Italian one. Foul Brood is a germ disease and is carried and spread in the honey. In an affected yard, robbing should be kept down and in treating for Foul Brood all combs taken from diseased hives should be either burned at once or put in a bee-tight place where the bees cannot find them or where the honey cannot leak out, until such time as they can be rendered for the beeswax in them.

May and June are months when an especially sharp look-out should be kept for signs of Foul Brood because it is at this season of the year that the supply of honey in a hive is at its lowest and cells which have held diseased honey are used for brood rearing purposes or else brood is fed with honey from diseased cells which in turn spread the disease.

If only a mild case is found in a hive, and only a few cells are affected it would in most cases be the most economical plan to defer treatment until the white honey harvest is over. Foul Brood honey is a perfectly good article of food, and in the case of a swarm which has only a few infected cells it might be allowed to gather the best of the crop and then shaken and allowed to build up on the darker flows of honey which follow such as buckwheat, golden rod, etc. They might in some cases need to be fed for the winter. When a colony is badly affected they should be treated at once.

The provincial department of Agriculture at Quebec has a staff of foul brood inspectors who inspect and advise regarding treatment of bees affected. They also supply tested Italian queens to bee-keepers under certain restrictions and assume the payment of a certain per cent of the cost.

For a bee-keeper who is not certain whether he has foul brood among his bees or not it is advisable to send a piece of comb, size about four by six inches containing suspicious specimen of brood, safely wrapped in oiled paper enclosed in a tin or wooden box addressed to the Department of Entomology, Aparian Division, Ottawa, Ontario, and ask for a report on it. Bulletins can also be obtained from the same source, which deal very fully with this disease and treatment.

HARRY W. JONES,

Bedford, Que.

duce the right conditions, except when leguminous crops are present, and the majority of azotobacter organisms soon die for want of food, only the ordinary small number of organisms persisting.

Manufacturers without a conscience have used these facts to sell to farmers cultures for non-leguminous crops. Usually they supplied the well known nitro culture, but even when they sold the azotobacter organisms the buyers were defrauded, because in the first place azotobacter organisms are naturally present in all soils, and further the soil does not supply them with sufficient food to fix nitrogen in any quantity.

As a rule more care is given to the seed bed when inoculated seed is to be used, and this care spent on the fields will result in a more abundant crop. Every farmer can work his fields and should not pay for the privilege of spending more time on his land.

To emphasize again:—

1.—Nitro cultures should only be used with the leguminous crops for which they are sold.
2. Any cultures sold to produce nitrogen in non-leguminous crops are valueless.
3. Nitro cultures to be of real value should have plenty of air. Naturally they do better in light soils, but much cultivation will bring heavy soil to a satisfactory condition.

J. VANDERLECK.

DISTRICT OF BEDFORD NOTES

THE season in the District of Bedford is very early this year. Vegetation is much further advanced than usual. The result is that the spring work has come on us earlier and with a greater rush than in the average season.

The sugar season came on suddenly and ended likewise. The run of sap was comparatively small, in many cases less than half the usual run. Sugar and syrup were easily disposed of for the most part.

The pastures were in good shape quite early. Even when the grass was still quite sappy many had their cows out. The advanced condition of the grass came as a boon to many who were short of feed due to the light hay crop of last year. This shortage of feed was not felt by those who put in a good supply of roots and ensilage.

The clover has come through the winter very well and has made a good start. The alfalfa in many cases has also come out in fine shape and is making a vigorous growth. The present indications are that we shall have good yields of both of these legumes.

The call for greater production of grain crops is being heard and answered by the farmers of this district. Not only is more of the ordinary grains being sown but many, who have not for several years, are growing wheat this year. In Brome County, Mr. Geo. Foster has offered prizes in each township for the greatest acreage of grain grown and also for the best fields of grain irrespective of size. Considerable interest is being shown in these competitions.

This year the total acreage devoted to ensilage corn and roots is being enlarged. It is being realized more and more that these two crops are of great advantage in milk production and that they are important factors in reducing the "feed bill". In both Brome and Missisquoi Counties ensilage corn has been chosen as the crop for the standing field crop competition. Through the observation of the methods of the several competitors and the results obtained much valuable information can be obtained as to best methods of corn growing. To assist in this work the Macdonald College Demonstrator issued a circular emphasizing important points to note in the successful production of ensilage.

The present indications are that we shall have a good season. By making the most of these conditions we can increase our chances for a profitable season. We have a good start, let us make the best of it.

E. A. L.

THE SPRING OUTLOOK IN RICHMOND COUNTY

Comments on the Agricultural Outlook

PROSPECTS for a good summer in the farming Districts of this County seem to be better than usual at the time of writing.

The sugar season was very short this year the result of an early spring which rapidly started the growth in the fields and trees.

The newly seeded meadows have come through the winter in good condition, and clover hay should be plentiful this season unless checked by late frosts.

Alfalfa is grown only by a few farmers but those few report that it is starting up nicely after the winter. Pastures have started up very rapidly and cattle were turned out earlier than usual. The early pastures were a great boon to many farmers as a number were hailed out in this section last year, so that hay and even straw have been scarce and high in value.

At the time of writing, orchards are commencing to blossom, and the trees are looking well with but little indication of winter injury.

Owing to the arrival of the warm weather so early in the season, there is considerable danger of late frosts killing the buds; besides the tent caterpillars are not nearly as numerous this year. As a result of the pruning and spraying demonstrations held in several centres this spring, a larger number of orchards than usual will be protected from the ravages of insects and diseases.

Seeding is progressing rapidly and most of the grain is safely underground and preparations are being made for the corn and roots. Many of the farmers who have been troubled with smut in the past took the precaution to treat their seed grain with formalin before planting and will, no doubt, reap a larger harvest in return.

By the time this appears in print, seeding will probably be finished and it will be time to think of haying, but at present prospects are bright for a prosperous summer among the farmers of Richmond County.

C. H. HODGE.

AGRICULTURAL CONDITIONS IN HUNTINGDON COUNTY

THIS has been in many ways a very early Spring in this section; most of the seeding of cereals was done in April. The land was in excellent condition at time of seeding and the grain crop has gotten way to a good start this Spring.

Some of the seeding, however, has been delayed, by the frequent rains and the cool weather prevailing at the present time.

A notable feature in regard to the grain crop is that many farmers are sowing wheat this year.

Pastures are looking very well for this season of the year and young stock and sheep have been on the grass for some time. Meadows are looking fine and promise a fine crop of hay this summer.

There will be the usual large acreage of silage corn planted this year, Golden Glow, Wisconsin No. 7, Leaming, and White Cap being among the varieties most used. Variety tests of silage corn are to be carried on in connection with the Seed Branch through the Macdonald College Extension Branch Office. Many farmers are starting the practice of checkrowing their corn in preference to the old method of putting in corn in drills.

Roots are not very extensively grown in this section; excellent crops were produced last year and the number of growers will increase somewhat this year. Some fertilizer experiment work with roots will be carried on this year. Turnip seed from Macdonald College was distributed to several school boys in the district with the object of starting the growing of root seed.

Cattle are, in too many cases, looking rather thin this Spring. This is largely due to the scarcity of fodder for the hay crop was poor last year, and the price of mill feeds is high. The abundance of grass will however, do much toward remedying this.

A Wool Growers' and Sheep Breeders' Association has been formed in the district. We will have over one hundred members and will handle about 12,000 pounds of wool. As many of the sheep are pure bred and of high quality, we will have an excellent grade of wool to offer. Practically all of the wool growers have been visited personally and are putting up their wool in first-class shape.

An item of considerable interest and of great importance to this section is the interest being taken in under-drainage. About 30 applications for free under-drainage surveys have already been sent in to the Department of Agriculture at Quebec and more are expected. It is also probable that we will have a traction ditcher working in the district before the end of the summer.

R. E. HUSK,

Demonstrator

May, 18th 1915.

SHERBROOKE COUNTY AGRICULTURAL SOCIETY

Sherbrooke, Que., Feb. 24th, 1915.

The Farmers of the County of Sherbrooke:—

Dear Sir:—

WE beg to call your attention to the fact that you have within the county in which you reside a live Agricultural Society, that is working with the one fundamental aim in view of helping the Farmer and the Agriculturist. To obtain the advantages offered by this Society it is only necessary that you should become a member, which can be done by paying the nominal fee of $2.00 to the Secretary.

Last year this Society paid in prizes to the Farmers of this County over $450.00 for crop and other competitions. This year we have drawn up an extensive programme which will necessitate the expenditure of a like amount amongst the Farmers of the county. This scheme of operation has been carefully drawn up by a committee of resident Farmers, and which I submit herewith for your approval.

1st Standing Crop Competition for Oats, not less than 3 acres	$75.00
2nd Standing Crop Competition for Clover, not less than 1 acre	75.00
3rd Standing Crop Competition for Wheat, not less than 2 acres	75.00
4th Standing Crop Competition for Potatoes (white), not less than 1 acre (Potatoes not to be sprouted in the house)	50.00
5th A Farmers' Vegetable Garden Competition	25.00

(Market gardeners barred. 10 points for attractive flower garden.)

There will be no charge for entry in any competition except those for Oats and Clover, the charge for these will be 25 cents.

6. The Society purposes, if there is sufficient money on hand, to purchase a Pure Bred Dairy Shorthorn Bull, to be placed at a convenient point within the county, for use by members of this Society. In connection with this, the members of the Society have been offered by Mr. J. H. M. Parker, of Lennoxville, the services of his Dairy Shorthorn Bull for the nominal fee of $1.00.

7. The Society received last year, from the Government, a very up-to-date and expensive Clover Huller, which is located at Lennoxville for the use of members of the Society, at a moderate fee. We expect to receive this year a Seed Separator, which will of course be of great value to those who take advantage of the use of the machine.

8. The Society intends offering, at the annual Sherbrooke Fair, a number of special prizes, amounting to considerable money, open for competition only to Farmers residing within the County of Sherbrooke and who are members of the Agricultural Society.

In addition to the numerous advantages mentioned above there is another of great importance to the progressive farmer, that is the reception each month of the *Journal of Agriculture*, a magazine edited under the direction of the Hon. the Minister of Agriculture of the Province and devoted wholly to the matters of interest to the farmer. This magazine in itself is worth more to any farmer than the cost of joining our society, and to all members of the society this is sent free every month.

These are a few of the advantages which this Society has to offer. There are many others, too numerous to mention, and we are calling your attention, and endeavoring to interest you in our work and the work which we are doing for the Farmers of this county.

Join our Society, become an active member, and receive these many benefits. It only costs you $2.00, which you will find is amply repaid.

Yours very truly,

W. S. ARMITAGE,
President

H. B. MILLER,
Sec'y.-Treasurer.

(We heartily congratulate this Society in the work it is undertaking.—*Editor*).

FARM WEEDS

Article VI

The Eradication of Special Weeds (Continued)

IN the two previous articles of this series attention was given to the eradication of Couch grass, Ox-eye Daisy, Perennial Sow-thistle. Canada Thistle, Mustard or Charlock, Paint Brush and Wild Carrot. There remain to be considered certain weeds which are sometimes abundant but which are not so troublesome as those already considered.

Hardback or Steeple Bush, a common weed in clearings and some pastures.

These weeds are bladder campion, chicory, field bindweed, rib grass, ragweed, lamb's quarters, fox tail, chickweed, hardback, wild tare, hemp nettle, may weed, pepper grass, burdock, dandelion, black knapweed, blue weed, wild radish, false flax, wild oats, curled dock. Some of these will be treated in this article, the remainder in the next.

(e) BLADDER CAMPION

This perennial weed with creeping rootstocks is too abundant in the meadows of many farms of Quebec, especially where these have not been disturbed for several years. It is a plant with tufted smooth stems bearing white flowers within a much inflated green calyx. The brown kidney-shaped seeds are borne in a capsule.

Field Bindweed, a most troublesome perennial with creeping roots and twining stems.

Where a meadow is but slightly infested, the weeds should be cut to prevent seed production, and an effort should be made to cut repeatedly the plants below the crown of the root. If, however, the field is badly infested the meadow should be broken up after haying, and kept cultivated until late autumn; then planted to roots or corn the following season.

(f) CHICORY OR SUCCORY

This weed, often called locally the "blue dandelion", is prevalent in this province. It has a large deep tap root, and a tall branched stem, bearing heads of blue flowers.

Bladder Campion, a common perennial weed in Meadows.

Chicory has blue flowers, and a thick tap root which makes it difficult of eradication.

Persistent cutting of the plants below the crown of the root will kill it. It can be pulled out by hand when the ground is moist.

(g) FIELD BINDWEED

This perennial is most difficult to eradicate. It has long creeping cord-like rootstocks which have the power of producing buds from any part. The stems are smooth and are able to twine about other plants. The flowers are white or pink and bell-shaped.

Rib-grass or Narrow-leafed Plantain, a tap-rooted perennial, with its seed.

This weed usually appears in small areas at first, and spreads from these to other parts of the fields by means of the cultivator. It is advisable to cultivate infested areas by themselves to prevent infesting the other parts of the field.

When a field becomes infested only the most careful cultivation will eradicate bindweed. The rootstocks should be pulled to the surface, raked up and burned. The land should be planted to root-crops or some heavy smothering crop for one or two seasons. As hogs are fond of the roots and sheep feed on the leaves it is sometimes possible to use these animals to advantage in its control.

(h) RIB-GRASS OR NARROW-LEAVED PLANTAIN

Rib-grass is frequently a pest in meadows, pastures and lawns. It has a short thick rootstock, basal leaves, a tall slender stalk or scape bearing a spike of flowers. With its deeply penetrating roots it withstands drought better than the common grasses.

When a field becomes infested it should be plowed and cultivated, and given over to a hoed crop the following year.

(i) BLACK KNAPWEED

This weed is also a perennial, and is locally abundant in some districts in meadows and along roadsides in the Eastern Townships. The stems are one to two feet high, and rough and hairy, and the flower heads are rosy-purple, hence are readily recognised. The plants should be cut early to prevent seeding; they may be readily pulled or grubbed out when the ground is moist.

(j) HARDHACK OR STEEPLE BUSH

This hard, reddish, woolly-stemmed weed is abundant in rough pastures in the Eastern Townships. It is hard to cut with the scythe after the first year of its growth. Seeding should be prevented, and the plants cut in July and August.

W. L.

THE CULTIVATION FOR CORN

Written by G. B. Mortimer of the University of Wisconsin

CORN should be cultivated not plowed; the plowing was done before planting time and the young corn plants do not like to be disturbed.

Idle cultivators are like idle boys, weeds get the best of them.

Miles of clean corn are like smiles on clean faces, both make us happy.

Crusty corn fields make crusty boys and both need stirring.

Weeds in the corn field, like flies in a dairy barn, should be swatted.

There is, at least, one more thing we need to bear in mind if we are seriously planning on harvesting a bumper corn crop this year. Cultivation, if it is properly done, pays.

As soon as the little plants are peeping through the ground they begin to talk. If we understand their language this is what they will tell us.

"There are some of those saucy fellows, called weeds, trying to crowd us out of our nice warm home. If you don't take them away, they will eat up most of the good things that you placed in our home for us. We want to do our best for you and we are going to if you will help us just a little. We get thirsty during the hot, dry month of August and unless you kill our ugly neighbors they will drink up all of the water and, even here in Wisconsin, we will not be able to produce a good crop of heavy ears.

"Keep our bed nicely covered with a fine, loose blanket of soil so that most of the moisture will be "barreled up" for us instead of letting it get out through the big cracks that sometimes make us so uncomfortable. If you do this we shall not get nearly as thirsty.

"Then there is one more thing that we want you to do. Sometimes it rains so hard that our blanket is packed closely about us. We don't notice this much at first but by and by our roots begin to choke, because they can't get enough oxygen and so, of course, they can't breathe properly. These crusty homes make us feel crusty and unless you come and stir it up you, too, will feel crusty when in the fall you find that we have only given you half a crop and that of poor quality. If you stir up our home every time after it rains hard, we will be able to grow and do as well as you expected us to do."

If the seed bed was prepared as we have already pointed out much of the trouble, as far as weeds go, has been avoided. The early and frequent cultivation did this. If, however, the soil is very weedy about the time the corn is coming up, it is a good plan to go over the field with a light harrow. By doing this countless numbers of weeds will be destroyed and the young corn plants will not suffer very much injury.

When the rows of corn can be seen stretching across the fields we must begin to think of keeping the cultivator pretty busy. Remember we said at the outset that corn should be cultivated and not plowed. Corn does not have a large deep tap root like alfalfa but is a surface feeder, having a large number of long roots scattered through the upper soil. If we cultivate so deep as to disturb any of these roots, the plants will be weakened because their supply of moisture and food will be cut off. Cultivating corn four or five inches deep when the plants are two or more weeks old sets them back and their growth may be so checked that they never fully recover. Here is a good rule to follow. Cultivate deep and close to the rows of corn the first time. This will not do much harm because the roots of the young plants have not spread out very much by this time. All other cultivation should be shallow, taking care to keep the surface as smooth as possible.

As soon as it is possible to work the soil following a rain, corn should be cultivated. This will kill the weeds that start to germinate and will also prevent the formation of a hard crust on the surface soil through which the moisture escapes so easily. When the dry times of August come and the weeds are well under control, further cultivation will not be necessary if there is a good blanket of loose soil covering the surface.—Union Wisconsin News Teller.

THE SEED LAW

WITH the opening of the 1915 seed trade, seedsmen, farmers and gardeners may wish to review the conditions under which sales may be made. The Seed Control Act provides that timothy, alsike, red clover and alfalfa seed must not be on sale for the purpose of seeding without being plainly marked with the grade, namely: Extra No. 1, No. 1, No. 2, No. 3. Farmers may sell seed below No. 3 in quality only to dealers to be cleaned and brought up to grade. All other grass, clover and forage plant seeds and those of cereals and flax must be marked in a plain and indelible manner with the common name or names of any noxious weed seeds present.

Seed of cereals, flax, grasses, clovers, forage plants, field roots and garden vegetables must have a germination of two-thirds of the percentage standard of vitality for good seed of the kind or be marked with the percentage that are capable of germinating. "Papered seeds" must be marked with the year in which the packet was filled.

Representative samples of seeds for purity and germination tests may be sent to the Seed Branch, Ottawa. Two ounces of grass seed, white or alsike clover; four ounces of red clover, alfalfa or seed of like size and one pound of cereals are desired. Samples under 8 ozs. may be sent without postage and are tested free of charge up to 25 in number for each person or firm.

SEED BRANCH, OTTAWA.

WEED SEEDS IN SOILS

THE presence of weed seeds in soils under different systems of culture and cropping should be suggestive to farmers. An investigation being conducted by the Seed Branch, Ottawa, shows a sod field which had been in hay or pasture for six years to contain 19,183 weed seeds in a surface square yard one inch deep, 8912 in the same volume of soil at a depth from two to three inches and 4309 at a depth five to seven inches. Another field which had been under a good system of cultivation and rotation contained 4,984 weed seeds in the surface soil and 3,020 in each of the other depths. The concentration of seeds in the surface layer of the sod field may be explained by weeds being allowed to reproduce themselves from year to year. Information as to the percentage vitality of weed seeds at the different depths is not yet complete but a large number of the surface weeds in the case of the sod field are vital. This investigation indicates the importance of short rotations, good cultivation and prevention of weeds going to seed. Other important methods of weed control are summer ploughing of sod lands followed by frequent autumn cultivation to destroy growing weeds, thorough cultivation during the growing season of hoed crops and after harvest cultivation of cereal crops which have not been seeded down.

Seed Branch, Ottawa

THE STORY OF AN INQUIRY

THIS is the Story of an Inquiry, an inquiry of as much importance to the country as such a thing can be. The story is told by Mr. Edgar D. Eddy, B.S.A., Chief Seed Inspector of the Dominion Department of Agriculture, and is given in Bulletin No. S-9 of the Seed Branch, of which Mr. Geo. H. Clark is Commissioner, under the title of, "An Inquiry Regarding the Wheat, Oats, Barley, Flax and Ensilage Corn Used for Seed in Canada." Mr. Clark introducing the work to the Honourable Martin Burrell, Minister of Agriculture, says that "the data obtained is interesting and even surprising." It is all of that. It was in the spring of 1913 that the inquiry was commenced and it was continued in 1914. Mr. Eddy explains that seed inspectors were instructed to visit farmers and procure samples of seed actually being put in the ground. This they did and over 3700 samples found their way to the seed laboratory at Ottawa. With them was sent information in regard to variety, source of supply, treatment for smut prevention, rate of seeding, cleaning and selection.

With the foregoing before him Mr. Eddy started his inquiry. After stating that in some cases samples were taken from lots that were yet to be cleaned before seeding, so that the summary of the purity test reports is incorrect to this extent, as indicating the impurities that were in the seed when sown, he sums up his conclusions by saying, "After making full allowance for all inaccuracies, it is clear that the value of the grain crops produced in Canada is enormously lowered each year through the use of poor seed. Surprisingly little attention is paid to choosing the most suitable varieties. The seed is seldom selected or graded, except to pass it through a fanning-mill once or twice, and often not even this is done; in many cases the mills are not equipped with proper sieves and little improvement is effected.

"Experiments have repeatedly shown that certain varieties of grain give the largest yields in particular districts. In order to obtain the best results, it is important to study varieties and select those best adapted to the soil and climate conditions under which they are to be grown. The lack of attention given to selection is indicated by the fact that over forty per cent of the farmers from whom samples of wheat, oats and barley were collected did not know the variety name of the grain they were growing."

Then follow a series of tables showing the number of samples and the varieties received from all the provinces and the results of the tests that were made. First we have treatment for smut, which is common in the Prairie Provinces, but not in Ontario, Quebec and the Maritime Provinces, although it could frequently be done with profit. Then the sources of seed supply are indicated followed by a table giving the Rates of Seeding. Cleaning and Selection are next in order, Mr. Eddy remarking, "The most significant feature of the inquiry is the information brought out in regard to the impurities sown with the seed as a result of the lack of proper cleaning." An illustrative table accompanies this section.

Summaries of impurities are given, which furnish, as the author says, "striking evidence of the extent to which weeds are introduced through dirty seed."

Sections are devoted to the "Germination of Oats, Barley, Wheat and Flax", "Ensilage Corn", to "Seed on the Ear and Shelled", to "Planting Hills and Drills" and to a "Summary and Conclusions," the whole forming a 32-page Bulletin of

LIVE STOCK

SUMMER FEED FOR DAIRY COWS

PROSPECTS for better pastures and more hay are considerably brighter, and farmers generally are looking forward to more luxuriant pastures for their milk cows than were experienced last year. In this respect, however, some farmers are more favourably situated than others in that they have at their disposal large areas of rough pasture land which they can reasonably depend upon for the entire season; while others have to be content with relatively smaller acreages of land that come into pasture every three, four or five years, as the case may be in their particular rotation. It is in the latter case particularly, that special provision should be made. Because of the dry seasons we have had lately, and in many cases overcrowded pastures, we have found altogether too many milk cows allowed to run short of feed during the months of July and August.

Every year the farmer loses a great deal of money due to the scarcity of grass. The cows do exceptionally well when first turned out to pasture, but in the middle and latter part of the season when the grass becomes dried out, less palatable, or less plentiful, there is a marked decrease in the milk flow. Not only does this lack of feed affect milk production at that time when milk is cheap, but it is allowed to become so serious that even later, in early winter when feed is furnished, it does not stimulate production nearly to the same extent as if the milk flow had been kept normal during the summer. The decrease in the milk produced in the summer and the increase of the relative cost of the milk produced in winter are two factors which should point out the economy of supplementing the scant and dry pastures with green feed.

The corn crop is widely grown by most dairy farmers, many having a few extra acres which they plan to feed their cows in the pasture early in the fall. This is, however, not sufficient as the corn is not mature enough to feed in the middle of the summer when pasture supplement is in its greatest demand. A mixture of two of oats to one of peas seeded about three bushels per acre makes excellent green feed. An acre of this mixture seeded as early as possible and another seeded about three weeks later should provide a continuous supply of green feed to a herd of twenty cows for a period of four or five weeks. The first acre should be

---

vital interest that should be extensively applied for to the Publications Branch of the Department of Agriculture, Ottawa.

LOCUSTS IN EASTERN CANADA

FEW people who have not experienced a plague of locusts can appreciate how terribly destructive the pest can be. In Circular No. 5 of the Entomological Branch of the Federal Department of Agriculture, Mr. Arthur Gibson, Chief Assistant Entomologist, tells something about locusts or "grasshoppers" that every tiller of the soil should know. He states that for the past three years the pest has been extremely destructive in the provinces of Ontario and Quebec. In one district of Lanark County alone an estimated loss of $6,000 was caused, representing 75 per cent of the crops. In a number of instances fields of oats and barley were cut green to save for feed, while in other cases in the province of Quebec farms have been abandoned owing to the prevalence of locusts. The insects are most impartial in their attention, attacking all kinds of grain and vegetables. After describing the different species which are liable to infest any part of Canada, Mr. Gibson suggests as an efficacious poison a bran mash that has been well tried, consisting of:

Bran	20 pounds
Paris green or white arsenic....	1 pound
Molasses..	2 quarts
Oranges and lemons	3 fruits
Water	3½ gallons

It is said that the oranges and lemons make the bait more attractive and hence lead to the undoing of the locust. Experiments made with this mixture, which can be concocted at small cost, have proved most successful, in one case no fewer than from 900 to 1,200 dead locusts being counted to the square yard. Besides illustrating the efficiency of the poison this statement also proves the alarming and overwhelming nature of the creatures. As every farmer should be prepared to protect his crops against the pest he should see to it that as soon as possible he becomes possessed of this invaluable circular, and this he can do by applying to the Publications Branch, Department of Agriculture, Ottawa.

WHEN SOILS NEED LIME

FROM a written description, it is not easy for every one to recognize indications of the need for lime. These can only be perceived by those who are accustomed closely to watch the changes in soil. Liming, however, is likely to be profitable on the following classes of land, viz.—(1) heavy soils, particularly those through which surface water passes with great difficulty; (2) soils of a lighter character if well stored with vegetable matter; (3) newly-drained or reclaimed soils; (4) old pastures, where there is no white clover, and particularly when the herbage is mainly composed of the plant known as agrostis or bent grass; (5) peaty and other sour soils; and (6) soils that are subject to finger-and-toe. Loams in a high state of cultivation, old pastures which are green in March, very light poor soils, soils which are known to have been recently limed, and all wet soils need not be limed.

The chemical analysis of the soil is not a sure guide to the need of lime; for lime, as we have seen, is not a direct manure, and is often used merely to correct soil defects which no analysis can disclose. To any one who has a good knowledge of chemistry a soil analysis may afford some indication of the probable effects of lime. Farmers, however, even if they all understand the chemistry of soils, do not require to resort to chemical analysis to find out whether liming will pay them. There is a far simpler and surer method, which will well repay them to adopt, viz., to purchase a few loads of lime and apply it to selected spots on the farm. If a beneficial result is shown in the quantity and quality of the succeeding crops the whole field should be similarly treated; but should there be no improvement the farmer would be ill-advised to spend his money on lime.

The time of year at which lime should be applied to tillage land must depend to some extent on the crop. This is, perhaps, the least important of the questions to be answered here, for if the land is in need of lime the main consideration is to apply it as soon as possible, and if the farmer succeeds in getting it put on in a powder, thoroughly distributed and kept near the surface, it will matter but little in a few years whether it was applied in autumn, winter, spring, or summer. There are, however, instances in which there is a right and wrong time to do the work. A good illustration of this is the application of lime as a preventive of finger-and-toe in turnips. We have seen that a year usually elapses before lime exercises its full effects on the soil. If the prevention of finger-and-toe be the object of liming, the application must not be made in the winter or spring immediately preceding the sowing of the turnip crop. The lime must be applied at least twelve months earlier.

It is customary in well devised rotations for turnips to follow oats after grass. For the prevention of finger-and-toe lime should be applied to the grass land before it is ploughed for oats. Lime, we have seen, rapidly sinks in the ground, and must become intimately blended with the soil if it is to have the desired effect. If, therefore, it be ploughed in deeply after oats the winter before the turnips are sown, the surface soil will receive little benefit; but if applied to the grass before that is ploughed for oats, and if the oat stubble is ploughed at the earliest opportunity, and the plough run an inch or two below the grass furrow, the lime will be brought to the surface and will exert its influence on the soil below it throughout the winter, while the spring cultivation for the root crop will thoroughly incorporate it with the soil.

APPLY LIME WHEN FIELDS ARE BARE

The proper time to apply lime to grazing land is in autumn, when fields are bare and grazing is of small value. The earlier it is applied at that season of the year the more chance there is of escaping the rains which might turn the powder into paste, and the more likely it is to yield a result next season. Lime may also be conveniently applied to young seeds in autumn, after the oat crop has been removed. To light land under tillage an excellent time to apply it is in spring, after roots, on the surface of the freshly ploughed land which is about to be sown with oats and seeds. The pressure of work on the farm at this season is the chief drawbak to this method.

The form in which lime should be applied needs no further description. It must be in the finest powder possible immediately it has been slaked.

The quantity that should be applied is a difficult question to answer. One general principle has already been stated, viz., the finer the powder, and the more even the distribution, the less will suffice. When lime is applied to strong soils for the purpose of making them more easily tilled and more pervious to water and air, fairly heavy dressings are necessary. For such purposes three tons per acre is the very least that will give satisfactory results. An additional ton in such a case might be given with advantage. For light soils, two tons per acre, if evenly distributed on the surface, will correct acidity, sweeten the herbage, increase clover, reduce bent grass, prevent finger-and-toe, and generally improve the quality and quantity of the crops. A two-ton dressing, however, must not be regarded as heavy and lasting; and it may require to be repeated after six or seven years.

The manner in which lime should be applied depends on the kind of soil, the object in view, the time of year and the amount. Generally speaking, however, it is a good plan to cart the newly burned lime direct to the field, to lay it out in small heaps about six or eight yards apart, and, if the land be under tillage, to cover these heaps with a light layer of soil, and finally to spread as soon as it has fallen to a powder. Many farmers favor the practice of putting the quicklime into one or two large heaps in the field, and slaking it with water. The powder is then put into carts, out of which it is spread with a shovel. This plan, however, necessitates more labor than the former method. It possesses the merit of yielding the finest powder, and is one to be recommended, when seeds and pastures are being treated.—"Journal of the Department of Agriculture for Ireland."

ready for use about the middle of July and the second acre should follow in nicely about two weeks after. Two acres of some early maturing corn such as Compton's Early or Dukes Improved Sweet should provide an abundance of green feed to follow the grain mixture and carry the same number of cows until the regular corn crop is sufficiently mature to feed or until the pastures are refreshed by the fall rains.

Corn silage is also a good summer feed. Every farmer should grow an abundance of corn and have a large silo, or better still two. Well preserved silage will keep perfectly for summer use, and where silo capacity is at all possible, should serve to replace much of the unprofitable pasturing.

A. R. NESS

PORK PRODUCED CHEAPLY ON PASTURE

PORK is produced from 8 to 10 per cent more cheaply on pasture than in the dry lot. Last year at the Iowa Station, with corn at 50 cents, the feed-cost for 100 pounds of pork was \$3.73 on alfalfa pasture and \$4.07 in the dry lot. After adding the original cost of the pig and interest on the investment, there is left a good profit.

For Minnesota, the best pasture crops for hogs are alfalfa, rape, clover and combinations of field peas, oats, rape or clover. The following figures from three experiment stations are given for comparison and also to indicate the possible value of a good pasture:

Crop	Pork Produced Per Acre		
	Missouri	Kansas	Iowa
Alfalfa	591.8 lbs.	408 lbs.	744 lbs.
Red Clover . .	560.7 "	400 "	728 "
Rape	274 "	202 "	865 "
Oats, peas and rape	394 "	......	966 "

In all of the above tests liberal grain rations were fed with pasturage.

At the Minnesota Station last year, three-quarters of an acre of rape furnished plenty of pasture for twenty pigs from the middle of June until frost. They were given, in addition, 3 pounds of corn per day for each 100 live weight.

Allow an acre of pasture for each 15 pigs, grain being fed. Seed rape now or later, using four to six pounds of seed per acre. By making a couple of seedings the best of pasture is available all summer.

Good pasture combinations are: rye (early spring), rape (summer); corn in field and rape (fall); rye, alfalfa, corn; rye, clover, oats and peas.

WOOL GROWERS' AND SHEEP BREEDERS' ASSOCIATIONS

Better Wool: Better Sheep: Better Lambs:

EIGHT Wool Growers' and Sheep Breeders' Associations are now operating in the province of Quebec under the supervision and direction of the Animal Husbandry Department at Macdonald College.

Need for Improvement

It was the general opinion among farmers in many sheep districts of the province that there was room for sheep improvement along a number of lines. Farmers have not been putting up their wool in a suitable condition to meet the requirements of the manufacturers, and consequently have not been receiving a sufficient price for their wool.

At present there is no means by which farmers are able to secure accurate knowledge of the numbers and excellence of purebred sires available for purchase. On the other hand purebred breeders have no means of ascertaining the requirements of farmers, hence there has always been a scarcity of purebred sires and many farmers have not been able to obtain such. Again many of our best sires have gone to the block before their period of usefulness had expired owing to the difficulty in making a suitable exchange. These factors have materially lowered the efficiency of our flocks.

The present prices being paid for wool and lambs have created a desire on the part of many farmers to establish new flocks, others wish to increase their present flocks. This has caused a great demand for breeding stock, little of which is available. Consequently, the growth of the sheep industry is being retarded and some steps are necessary in order that sufficient expansion may take place. An effort must be made to retain for breeding purposes a sufficient number of our best ewe lambs which have previously gone to the block, thereby increasing the number and raising the standard of sheep kept.

A study of marketing and market conditions makes it apparent, that farmers in many cases are not obtaining sufficient value for their lambs and other commercial stock. Too much of this stock lacks development and is thin in condition. Again practically all the lambs are sold in the fall of the year, at which time, owing to a glut on the market, prices are lowest. This state of affairs could, in a measure at least. be offset by adopting more diversified systems in the breeding, rearing and fattening of lambs.

Objects of Associations

Farmers' Wool Growers' and Sheep Breeders' Associations have been organized with the following objects in view.

(1) To endeavour to encourage farmers to take more precautions in the care and preparation of wool for market, and to have such wool graded and sold according to grade rather than at a flat rate.

(2) To endeavour to encourage and facilitate the purchase, sale and exchange of purebred and other breeding stock.

(3) To take such steps as will tend to bring about more uniform and better finish grades of market lambs and to encourage and facilitate the purchase, sale and exchange of Commercial stock.

Grading and Co-operative Sale of Wool

The wool from each association will be graded and sold co-operatively. A large number of demonstrations have been held for the purpose of showing the best methods in shearing and rolling of fleeces, and thereby encouraging farmers to put up their wool in the proper shape for market. Regulation wool sacks have been supplied to each member of the associations. These protect the wool from dust and other dirt, as well as from weathering. Improved methods of shearing, proper rolling of fleeces with the flesh side out and the use of regulation wool sacks have greatly improved the wool clip of association members and such wool should command the highest price.

Grading commenced in May and will be completed in June for all the associations. As soon as graded, the wool will be sold according to grade. Manufacturers will be induced to send representatives to the grading centres so that the wool from the associations will be sold direct to the consumer. In this way each grade will be sold for its full market value.

Farmers will be given every opportunity of seeing the wool graded and every effort will be made to impart a knowledge of wool grades and qualities.

Wool Exhibits

In connection with each association a wool exhibit will be held and prizes will be awarded for the best fleeces from the most popular breeds as well as for the market grades. Special prizes will also be awarded for the best rolled fleece for market. The following are the rules and regulations governing the wool exhibit.

(1) All entries must be sent in before............ to the Secretary of the Association and must be in place for judging before.................

(2) Farmers who are not members of the Association cannot enter in any of the classes.

(3) One fleece only may be entered by each member in each class.

(4) Awards will be made by a member of the Animal Husbandry Department at Macdonald College and the expert wool grader in charge of grading.

(5) Fleeces entered for prizes will be sold and the proceeds remitted to member making entry.

Prizes will be awarded in the following classes.

	1st.	2nd.	3rd.
Shropshire fleece	\$1.00	.75	.50
Oxford fleece..	1.00	.75	.50
Leicester fleece	1.00	.75	.50
Medium combing fleece	1.00	.75	.50
Low medium combing fleece	1.00	.75	.50
Lustre braid fleece	1.00	.75	.50

Special—Best rolled fleece for market, \$2.00.

A. A. MACMILLAN

THE DISTRICT OF BEDFORD WOOL GROWERS' AND SHEEP BREEDERS' ASSOCIATION

WITH headquarters at Cowansville the District of Bedford Wool Growers' and Sheep Breeders' Association has been organized. The object of the association is to promote the interests of the sheep industry generally and for this season particularly the marketing of the wool. Wool will be shipped from two centres, Cowansville and Knowlton. Through the Macdonald College Demonstrator a number of shearing and wool-rolling demonstrations were held. At these the proper method of preparing the fleeces for the wool market was shown.

The Officers are,

President, John Gibson, Cowansville.
Vice-Pres. J. H. Aitken, West Brome.
Secretary, E. A. Lods, Cowansville.
Directors,
M. Curley, Dunham.
J. H. Pibus, Knowlton.
W. Pendlebury, Mystic.

MOLASSES FOR DAIRY CATTLE

IN the 1913 report of the Canada Experimental Farms, Director Grisdale and Mr. Archibald give important information on the above subject.

From experiments conducted to determine the feeding value for dairy cattle of black-strap molasses, it was found that when molasses replaces a meal (composed of bran, gluten meal, cottonseed meal, and dried brewers' grains 6: 3: 2: 2) pound for pound to the extent of 10 per cent of total meal fed, it proves quite satisfactory; this is due probably in large measure to the increasing of the palatability of the feed. When molasses replaced the meal to the extent of 20 per cent, the cows dropped in their milk flow, and milk cost, to produce, more per hundred pounds; it is worthy of note that on the 20 per cent molasses (1½ to 2 lbs per day) the cows gained in weight and condition. When molasses replaced meal to the extent of 30 per cent, the cows dropped heavily in milk flow and milk cost more per hundred lbs. This quantity of molasses slightly scoured the cows and caused loss in body weight.

HOW TO ERECT SMALL CONCRETE BUILDINGS

THE present insistent demand for the substitution of durable, sanitary and fire-resisting materials for those not possessed of these properties has been a pronounced factor in hastening the adoption of concrete. The change means impervious and monolithic structures as opposed to those consisting of the more familiar types of masonry with their attending wooden features of combustible nature, the latter also affording refuge for much that is noxious and unsanitary. This enduring method of construction is now applied to all parts of buildings in order that there may be a practical elimination of maintenance cost.

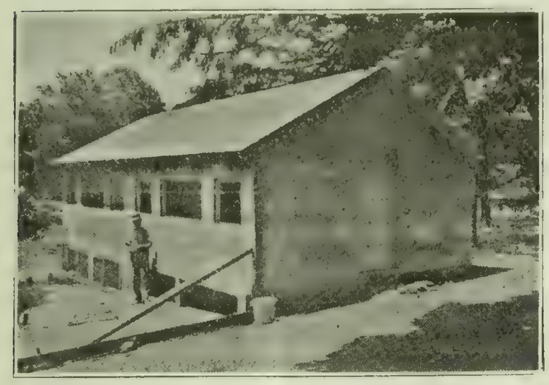


Fig. 1.—A Concrete Poultry House.

This building rests on concrete piers and has a concrete floor, partition and walls. The walls are only 4 inches thick.

Small buildings for one purpose or another are always required upon the farm. These structures include poultry houses, hog pens, smoke houses, wagon houses, garages and buildings designed for storage purpose. If they are built of masonry or frame, the service of experienced workmen are usually required unless the structures are of the rudest type. The purpose here is to describe briefly a method of constructing, without the aid of mechanics, small concrete buildings for some of the uses specified. Dimensions may be increased or reduced as occasion requires. Where enlarged upon and supplied with proper conveniences, a building of this character would answer admirably for a small residence. If the natural color of the concrete is objectionable, it may be coated with a wash in any color desired, thus making these small structures a picturesque as well as useful appurtenance to the main buildings of the farm.

THE FOUNDATION

Let it be assumed that the building is to be 8 feet wide by 12 feet long with a height to the eaves of 7 feet, inside dimensions. A building of this size might be suitable for several of the purposes mentioned above. The foundation should be 12 inches wide and 3 feet deep, which will carry it below frost line. Mark on the ground a rectangle 7½ feet wide by 11½ feet long. Outside of this rectangle mark a larger rectangle 9½ feet wide by 13½ feet long. This will leave a space of one foot between the lines all round. Dig between these lines to a depth of 3 feet. This forms the foundation trench. The concrete for the foundation should be mixed in the proportion of 1 part Portland cement, 2½ parts sand and 5 parts stone or gravel. Fill in the foundation trench with concrete to ground level, being careful to prevent earth from the trench walls from falling into the concrete. The top of the foundation should be brought to the surface of the ground and made perfectly level. To insure this test it with a carpenter's spirit level.

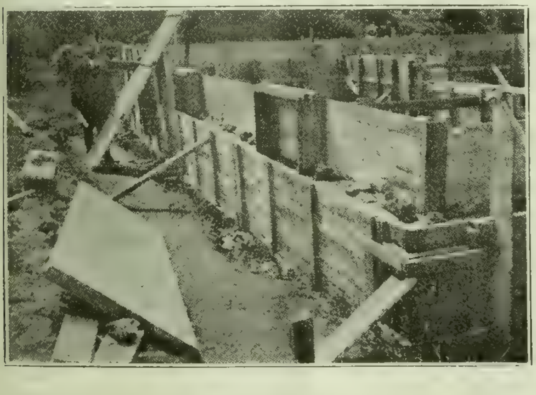


Fig. 2.—Sectional Form for Concrete Wall Construction.

THE WALLS, WINDOWS AND DOORS

The walls of a building of this size will need to be only 6 inches thick and they should be erected on the center of the foundation, leaving 3 inches of foundation on both sides. The forms can be made complete, and, if more convenient, can be assembled flat on the ground and then raised into position. The wall forms should be made of 2 x 4-inch studding placed upright and spaced about 2 feet apart. Upon this studding should be nailed, horizontally, 1-inch boards. These boards will be next to the concrete and must be fitted together, so as to insure a tight joint, and if it is desired to give a very smooth surface to the finished wall, the joints should be carefully matched. The forms, to prevent them from spreading, are tied by means of twisted wire passing between the 1-inch boards and around the upright studding, as shown in Fig. 3. To provide for the window openings a rough frame made of 1-inch boards, 6 inches wide, should be set in the forms at the proper location. Sometimes, after the forms have been filled with concrete to the height of the windows, the window frame itself is placed in the form and the concrete cast around it. The openings for doorways should be made in the same manner. As soon as the forms for the walls—both the inside and outside forms—are in place and made plumb, the concrete can be deposited between them. The top surface of the concrete previously placed in the foundation should be rough but thoroughly clean and very wet in order that a good bond between the concrete in the foundation and the concrete in the wall will result. To prevent the development of cracks in the walls it is a very good practice to reinforce them with fence wire or light rods, running in both directions. This is not absolutely necessary, however, for a very small structure, but in any case it would be well to place in the corners where the walls join, light rods bent in the shape of an "L". These rods should be 2 or 3 feet long and placed about every 12 inches of height. The frame for the doorway should be placed in position before the concreting is started. It is sometimes the custom to tack lightly to the door frame a strip of wood tapered so that its larger side is in the concrete. When the rough door frame is removed this strip remains in the side of the door and can be used for fastening the door hinges. Some prefer to dispense with this strip of wood. They drill directly into the concrete wall in providing for hinges.

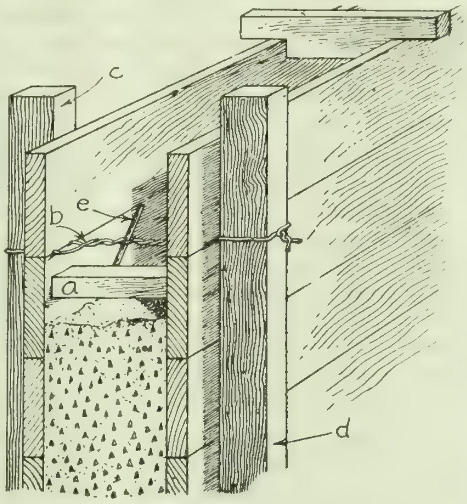


Fig. 3.—Method of Tying Forms with Wire to Prevent them from Spreading.

The concrete for the walls should be mexed mushy wet and in the proportion of 1 part Portland cement, 2 parts sand and 4 parts stone or gravel. In placing the concrete spade it thoroughly with a thin board paddle, thrusting the latter between the forms and the concrete in order that the stone or gravel may be forced away from the forms, which will leave a smoother surface than would otherwise result. This not only allows the rich mortar to flow against the forms, but prevents the formation of air pockets and projecting stones at the surface of the wall. It will be found convenient to place the concrete until it reaches the height of the window-sill. The window frames are then placed and the concreting continued until the height is about 2 inches above the top of the windows. Then, in order to strengthen the concrete over the window openings, lay two ½-inch steel rods over each window. These rods should be long enough to extend about a foot on each side of the window space. In a similar manner rods should be laid over door openings, these rods to prevent any cracking of the concrete over the openings. The balance of the concrete is then deposited until the height of the eaves is reached.

ROOF CONSTRUCTION

On the top surface of the wall there should be imbedded vertically in the fresh concrete ½-inch bolts with the heads down. These bolts extend about 12 inches into the concrete and about 6 inches above. They can afterwards be used in fastening down the wooden sill to which the rafters are attached, if the roof is to be constructed of wood. Either a flat or a peaked roof can be used. If a flat roof, it is sometimes the practice to arrange for rectangualr pockets in the top of the walls, into which the roof beams can be set. When a flat roof is to be constructed make one side of the building lower to provide sufficient pitch for drainage. The forms for the walls should be left in place about one week and no weight should be placed on the walls for three weeks or one month.

If a concrete floor is desired, proceed as in the case of sidewalk construction, that is to say, put down a layer of cinders or gravel and place over this the concrete pavement. Make this of a 1: 2½: 5 mixture of Portland cement, sand and stone. To prevent the concrete pavement from cracking divide it into sections or slabs, say 3 or 4 feet square, being sure that the joints extend entirely through the concrete.

If a wooden floor is preferred, the beams or stringers may rest upon the 3-inch projection of the foundation walls.

THE OX WARBLE

THIS species has been known for more than a hundred years as one of our most injurious animal parasites, especially those working upon cattle, and yet but very little is known about it by the general farmer and stock-raiser.

The losses caused by this insect each year aggregate millions of dollars. Not only is the hide of the infested animal punctured by the emerging larvae, causing a reduction in value of one-third, but the presence of the grubs in the animal's back is a source of loss which can not be neglected. The latter is very often overlooked. The poor condition of the animal, its inability to take on flesh, or poor showing at the milk pail, are factors attributed to other causes. Most uninformed cattlemen attribute these conditions to poor care, lack of proper nourishment, or physiological troubles. The presence of fifty or sixty burning, running ulcers on the back of the animal seems a matter of small importance, and is considered lightly by most people. But, Mr. Farmer, how much would you accomplish if you had fifty or sixty boils on your back? The two conditions are analogous and conducive to the same results.

The insect causing all of this trouble is one resembling, in the adult stage, the horse bot fly, or as in sometimes called, the "nit" fly, but some-

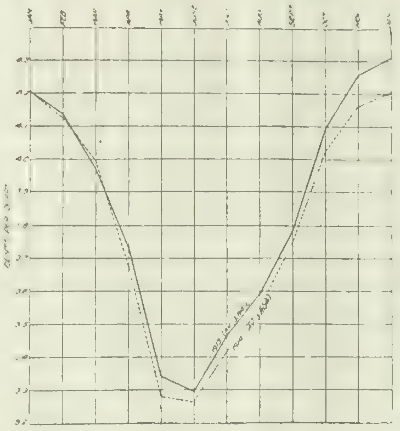
THE DAIRY

FARM MILK PRICES IN UNITED STATES

Average Price Paid Producers in 1914 Lower than 1913 Figure—March Prices Better

THE average price paid to farmers for milk in 1914 was 3.804 cents a quart, according to statistics recently compiled by the Department of Agriculture. This is slightly lower than in 1913, when the average for the entire country was 3.849 cents a quart. As the accompanying table shows, prices varied greatly, according to the season of the year. The average price in January was the same in 1914 as in 1913, the price for March was higher in 1914, and the price for all other months was lower in 1914.

In order to obtain these averages the investigators reduced all prices to a common unit, namely, the net price f. o. b. the farmer's shipping station.



Average monthly prices for the entire United States in cents per quart at farmers' shipping stations. The dotted lines indicate prices in 1914, the solid lines in 1913.

It was impossible to ascertain the total quantity of milk supplied in the various sections, or at different seasons, and for this reason the price per quart for each shipment was alone considered, the quantity being disregarded. The averages, therefore, are not absolutely exact, for larger quantities of milk are sold at some seasons than at others; also the dealers, who report the prices, handle different quantities of milk.

Commercially, milk is still bought in a number of ways, 100 pounds sometimes being the unit, while other prices are quoted per pound of butter fat, per gallon, or per can of 8½, 32, or 40 quarts. Some dealers offer premiums for milk richer than the ordinary or a higher sanitary grade.

Milk, it will be noted, was highest in December, when the average price for the entire country was 4.205 cents a quart, and lowest in June, when it fell to 3.264 cents. The accompanying table shows the average prices in the various geographical di-

---

what larger. The adult is seldom seen about the cattle. It is timid and appears only when everything is quiet. The eggs are deposited upon the hairs during the spring and summer, and the animal, upon licking them, carries the egg or larva into its mouth. The young maggot passes into the gullet. From the gullet it migrates slowly through the tissues toward the back. It arrives beneath the skin, and a lump or excrescence begins to appear about mid-winter. This lump gradually grows larger until the middle or latter part of April, when the full-grown grub, which caused the lump, emerges through a hole cut in the hide some time previous, and falls to the ground. It then burrows into the ground and transforms to a pupa, and the adult, two-winged fly appears from three to six weeks later. This completes the life cycle, which occupies about one year.

There is a prevalent, erroneous notion that the eggs of this warble are laid upon the back of the animal, and the larvae bore beneath the skin to develop. There is no definite proof that such is the case. Also, the large, black horse fly, often seen on the backs of horses and cows, is not, as is often supposed, the parent of this grub. They are separate and distinct species and quite different in habits. These are smaller and more hairy than the large horse flies.

This is one of the easiest insect pests to control that we have. In the winter and early spring, all the insects are in the larval stage in the backs of the cattle. If every one owning cattle would squeeze the grubs from the backs of his animals, and destroy them, there would be no nucleus for a new generation, and consequently, no ox warbles the next year.

When the grub "ripens," i. e., when it matures, a large hole appears in the lump,bordered with pus. This condition usually appears in April and May. When it comes, wrinkle up the hide containing the grub, get the two thumbs and first two fingers on each hand beneath the lump and squeeze. The grub usually flies to the ceiling like a wad from a pop gun; now tramp on it, and the job is completed.

CONDIMENTAL STOCK FEEDS

CONDIMENTAL stock feeds, stock tonics, etc. are sold everywhere and in large quantities in the aggregate. In so far as these materials claim to be feeds and to possess actual nutritive properties, they can be dismissed at once, as they are not fed in sufficient quantities to be of any importance whatever as feeds, and are, furthermore, too expensive to be used for this purpose. As regards their value as tonics and medicine, on the other hand, the examinations made of the materials have shown that they do not contain sufficient amounts of substances possessing medicinal properties to have any influence on stock one way or the other. A large bulk (one-half or more) of the stock feeds are made up of some common feeding stuffs, like mill feeds, corn meal, oil meal, ground screenings, etc., and the balance generally consists of salt, charcoal, or sulphur, with a small amount of mild drugs or condiments, like gentian, fenugreek, sassafras, ginger, pepper etc. The doses of these condiments which an animal receives in an ounce or two of the stock feed, fed as directed, are too small to have any medicinal effect whatever, as they make only a small fraction of the dose recognized by veterinary science, on account of the small proportions in which they are present in the stock feeds.

Practical Tests

The preceding remarks are largely based on theoretical considerations, which, however weighty they are, may not settle the matter in the minds of many people. The stock feeds have, however, been tried out at more than a dozen different experiment stations, and the results obtained in the trials are given in the publications of these stations and may be studied by all interested. The author made an investigation of the main stock feeds on the American market several years ago and compiled the results obtained on all experiments that were conducted with them up to that time in this and foreign countries. In these experiments 992 farm animals were included in all, viz., 78 steers, 81 dairy cows, 604 sheep, 112 pigs and 117 hens. Out of the 23 different trials compiled, only two showed the stock feed to possess any merit, and the interpretation of the results of the two exceptions is open to question. The evidence is, therefore, practically unanimous against the use of condimental stock feeds, and goes to show that, when fed under conditions similar to those that prevailed in these experiments, the addition of a stock feed to the ration is a positive disadvantage, both with reference to the production of the animals and the relative cost of the production.

Summary of the Evidence

The evidence at hand with regard to condimental stock feeds shows that there is practical unanimity of opinion among scientific men who have given the subject special study, in regard to several points connected with these so-called feeds or tonics.

1. They are of no benefit to healthy animals when fed as directed, either as to increasing the digestibility of the feed eaten or rendering it more effective for the production of meat, milk, wool, etc.

2. They are of no benefit as a cure-all for diseases of the various classes of live stock; neither do they possess any particular merit in case of specific diseases, or for animals out of condition, off feed, etc., since only a small proportion of ingredients having medicinal value is found therein, the bulk of the feeds consisting of a filler which possesses no medicinal properties whatever.

3. Exorbitant prices are charged for these feeds, as is natural, considering the extensive advertising the manufacturers are doing and the liberal commissions which they pay their agents and dealers. The large sales of stock feeds are doubtless mainly to be attributed to these facts.

4. By adopting a liberal system of feeding farm animals and furnishing a variety of feeds, good results may be obtained without resorting to stock feeds of any kind. If a farmer considers it necessary to give stock feeds at times, he can purchase the ingredients at a drug store and make his own at a fraction of the cost charged for them by the manufacturers.

Home-made Stock Tonics

If a farmer considers it necessary to use stock feeds for animals in poor condition of health, off feed, or ailing in one way or another, that is not plainly a case for a veterinarian to attend to, it would seem that the better plan would be to buy the separate ingredients at a drug store and mix them in the proportions indicated below. He will save money thereby and will have the satisfaction of knowing just what he is feeding his stock and of feeding it in a much more concentrated form than in the case of commercial preparations. The following three mixtures of drugs, etc., have been suggested by the Vermont station and the Iowa Station (Formula 3) :

Formula 1.—Ground gentian, one pound; ground ginger ¼ pound; powdered saltpeter, ¼ pound; powdered iron sulphate, ¼ pound. Mix and give one tablespoonful in feed once daily for ten days. omit for three days, and feed as above for ten days more.

Formula 2.—Fenugreek, ½ pound; ginger ½ pound; powdered gentian, ½ pound; powdered sulphur, ½ pound; potassium nitrate, ½ pound; resin, ½ pound; cayenne pepper, ¼ pound; ground flaxseed meal, 3 pounds; powdered charcoal, 1½ pounds; common salt, 1½ pounds; wheat bran, 6 pounds.

Formula 3.—Powdered gentian, 1 pound; powdered ginger, 1 pound; fenugreek, 5 pounds; common salt, 10 pounds; bran, 50 pounds; oil meal, 50 pounds.

Woll's "Productive Feeding of Farm Animals"

POULTRY

DEMONSTRATION POULTRY HOUSES

In order to determine the most satisfactory types of houses for laying fowls for the province of Quebec the Poultry Department of Macdonald College has had erected six demonstration houses in different parts of the province. In Pontiac county the house is located at Yarm on the farm of Mr. Bert Hodgins, the house in Chateauguay is located at Athelstan on the farm of Mr. E. C. Boyce, in Rouville county the house is located at Rougemont on the farm of Mr. Edgar B. Standish, in Missisquoi county the house is located at Dunham on the farm of Mr. G. M. Beach, in Sherbrooke county the house is located at Capelton on the farm of W. G. Loomis, and in Compton county the house is located at Cookshire on the farm of Mr. E. N. Chaddock.

These houses will serve the purpose of experimentation and demonstration, the primary object being the improvement throughout the province of farm poultry housing. The houses have been located on carefully selected farms with the purpose in view of making the demonstration of as local a nature as possible. Three different types of houses have been erected and the conditions of management are made as comparable as possible.

Careful records are being kept for at least three years concerning the management of the poultry plant and expenses and receipts. The houses are open for inspection at any time and farmers are invited to examine the house in their district. Each farmer who has a demonstration house is always glad to assist the farmers of the community in their poultry housing problems. When the records are completed at the end of three years it is hoped that the available information obtained from this demonstration scheme will be of much value in improving the poultry industry through better housing of the laying stock.

EDUCATIONAL EXHIBITS

In regard to extension work this department arranges educational exhibits for the larger poultry and agricultural shows held in the English speaking sections of the province. These educational exhibits deal particularly with the commercial side of the poultry industry. These exhibits are comprised of models of poultry laying houses, brooder houses, trap-nests, fattening crates and batteries, dressed poultry cooling racks, egg cases, shipping boxes, incubators, brooders, and many other models of apparatus used in the raising of poultry. Charts showing the ideal types of the more important breeds of poultry, reading charts which emphasize the leading features, of the poultry industry, and other material is used to encourage the interest in poultry geeping. Blue prints, giving plans and specifications of poultry houses, are distributed free as well as our bulletin on "Farm Poultry"!

M. A. JULL

FEED CHICKS LIGHTLY

Many chicks die from being overfed. The little chick is a fairly hardy creature when normally healthy, but if it is not fed carefully its digestive system is upset readily and death often results. Do not feed the chick until it is thirty-six hours old for it cannot digest the grain which you give it in addition to the yolk sac which is usually not completely absorbed at the time of hatching. A good practice is to feed a little at a time but feed frequently. The more often chicks are fed each day the less danger there is of overfeeding. When the chicks are quite young they should be fed five times every day. When they get to be about six weeks old then they could be fed three or four times every day. Wet sloppy food should be avoided always. Give the chicks dry cracked grain or dry mashes. The mashes, which are usually made of wheat bran, cornmeal, crushed oats, middlings and beef scraps, are mixed thoroughly and moistened with water or better still with sour skim milk. If fed wet it is given in troughs. See that it is just slightly moistened as foods which are too wet do not agree with chicks.

Do not feed too much hard boiled egg at the start as the chicks cannot digest it readily.

If you have sour skim milk available give it to the chicks all of the time as it is one of our best chick feeds.

Feed in such a way that the chicks will take plenty of exercise all of the time. Feed a little at a time but feed often and feed good feeds.

M. A. JULL

REARING THE YOUNG STOCK

When the chicks are weaned from the brooder or hen they should be put into comfortable houses that are free from draughts and well lighted and ventilated. The time to wean them depends on the condition of the weather. If they are moved from the brooder or hen in cold or damp weather they are apt to get chilled and they will crowd and kill the weak ones.

---

visions of the country as defined in the census.

From this table it appears that milk was at its highest in New England when the average price for November was 5.049 cents a quart. The average for the year was also highest in New England, 4.657 cents a quart. The lowest price was for June in the Middle Atlantic States, when the average price was only 2.841 cents. One dealer in the Middle Atlantic States reported that he paid only 90 cents a hundred for milk in the month of June, which would be only a little more than 1.9 cents a quart. The greatest range in prices was found in the Middle Atlantic States, where the December price was 4.204 cents and the June price 2.841, a difference of 1.363 cents.

These figures were compiled by the Dairy Division of the Bureau of Animal Industry and the Bureau of Crop Estimates, from figures furnished by 226 milk dealers throughout the country.

Average Prices for Milk Paid Farmers in 1914; Figures are Cents per Quart Net, at Farmers' Shipping Stations

Section	Jan.	Feb.	Mar.	Apr.	May.	June.	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average for year.	Average for 1913.
New England	4.883	4.858	4.769	4.500	4.215	4.195	4.360	4.447	4.603	4.969	5.049	5.039	4.657	4.571
West South Central	4.896	4.896	4.562	4.396	4.396	4.396	4.396	4.396	4.729	4.896	4.896	4.896	4.646	4.312
Pacific	4.466	4.399	4.046	3.848	3.811	3.911	3.943	3.973	4.111	4.242	4.237	4.350	4.111	4.270
South Atlantic	4.495	4.467	4.392	4.142	3.551	3.523	3.542	3.542	3.868	4.425	4.576	4.604	4.094	4.031
East South Central	4.604	4.439	4.439	3.772	3,190	3.190	3.486	3.691	3.691	3.939	4.023	4.023	3.874	4.259
West North Central	4.015	3.948	3.882	3.635	3.208	3.309	3.386	3.493	3.615	3.758	3.875	3.924	3.670	3.508
Middle Atlantic	4.139	3.965	3.825	3.408	2.920	2.841	3.046	3.263	3.575	3.949	4.169	4.204	3.608	3.634
East North Central . . .	3.974	3.932	3.833	3.512	3.097	3.057	3.262	3.422	3.551	3.766	3.916	3.955	3.606	3.503
Mountain	3.864	3.864	3.606	3.231	3.231	2.973	3.098	3.098	3.356	3.606	3.606	3.864	3.449	3.642
True average 1.	4.203	4.123	3.996	3.678	3.280	3.264	3.416	3.549	3.745	4.023	4.163	4.205	3.804	3.849

1 True average of all sources (226) reporting.

SOME DIFFERENCES

Here and there amongst our dairymen are such splendid results attained that one can only be astonished at the complacency with which other so-called dairymen continue to be content with the pitifully small average yields of milk per cow. Why do the huge differences exist?

Just a few miles from here is one of those poor herds, six cows with an average of only 3,338 pounds of milk; the highest yield only 4,000 pounds.

In contrast to that, two good herds in western Ontario indicate the possibilities for the man whose eyes are open to what milk records have to reach. One herd of 12 grades average 10,657 pounds of milk and 317 pounds of fat; the second herd of 22 grades averaged 10,542 pounds of milk and 350 pounds of fat.

These marvellous differences in herd yields drive home hard facts. Men differ in their methods of feeding and handling cows, feeds differ in value, cows differ considerably in their inherent capacity as milk producers, they are not all cast in the same mould.

In the above two good herds the constant use of milk records has proved an excellent lever in raising the production. Cow testing pays.

C. F. W.

BENEFITS OF KEEPING MILK RECORDS

Mr. J. B. Lowery, Dairy Recorder at Frankford, Ontario, reports the following results from keeping milk records in a herd in his Dairy Record Centre.

	1912		1913		1914	
No. of Cow	Lbs. Milk per cow	Lbs. Fat per cow	Lbs. Milk per cow	Lbs. Fat per cow	Lbs. Milk per cow	Lbs. Fat per cow
1.	6720	226.4	7799	272.5	8338	279.1
2.	6572	207.0	6480	223.5	7189	254.6
3.	5392	179.7	6005	229.5	7531	254.3
4.	5917	195.2	6430	223.6	6825	241.4
5.	6102	193.6	6404	210.0	6416	218.1
6.	6660	213.7	6420	219.9	7384	259.8
7.	6767	201.5	7509	254.3	8100	278.3
8.	4892	162.4	6665	215.3	8163	266.3
9.	3552	102.8	6065	208.5	7889	257.0
10.	5235	191.0			6528	237.6
Total:	57,809	1,874.3	59,777	2,057.1	75,363	2,546.5

Year	Average Lbs. Milk per cow	Average Lbs. Fat per cow	Average % Fat in milk.
1912	5780	187.4	3.24
1913	6641	228.5	3.82
1914	7436	254.6	3.42

	Lbs. Milk per cow	Lbs. Fat per cow.
Increase 1912 to 1913	861	41.1
" 1913 " 1914	795	26.1
" 1912 " 1914	1656	67.2

When moving the chicks, they should be examined for lice. The lice are usually under the wings and on the head. If any lice are found the chicks should be dusted with sulphur or lice powder.

The houses should be kept clean, and disinfected or whitewashed. If the chicks are not well feathered, a square frame can be made and covered with burlap or cotton and suspended from the ceiling for the chicks to go under at night. This will keep the heat given off by their bodies close to them. The houses should be of the colony type, which can be moved from place to place in the pasture fields or along the cornfields where the chicks can have free range. They will eat the insects and get plenty of green food.

The feeding should be done by the use of self-feeding hoppers so as to make less work for the attendant. The water may be kept in barrels with self-regulating faucets. The grain ration should be equal parts cracked corn and whole wheat. By feeding one feed of grain by hand each day the attendant can keep better watch over the flock. The weak and stunted chickens can be culled out and disposed of. The mash should be composed of

Bran	100 lbs
Ground oats	50 "
Feed flour	50 "
Corn meal	50 "
Beef scrap	25 "

The grain and dry mash kept in hoppers should be before the chickens at all times. Never let the hoppers get empty. The same mash should be fed in a moist condition twice a day, giving just what the chickens will clean up and be satisfied with. The chickens relish the wet mash more than the dry. The wet mash should be moistened with sour milk or water. Milk fed chickens make rapid gains in flesh.

The cockerels and pullets should be separated and the cockerels which are to be saved for breeders should be kept apart from those intended for market purposes.

The pullets and cockerels intended for breeders should be fed carefully in order to mature normally. The others should be forced to make as rapid gains as possible.

Give the chickens plenty of range, plenty of shade, good attention, fresh water and feed and they will make rapid growth.

W. A. MAW,

Macdonald College.

POULTRY GENETICS

Review of the Work in Experimental Poultry Breeding, now under way at the various Agricultural Experiment Stations in the United States

THE RESEARCH COMMITTEE ON ANIMAL BREEDING

PROBABLY no station has made more contributions to the theory of animal breeding than has that of Maine, whose department of biology, organized in 1907, is directed by Raymond Pearl, and whose staff includes 10 associates and assistants and a number of graduate students. To date 72 papers have appeared from this laboratory, most of them dealing with some phase of genetics. Among the problems now under investigation is the important one of the inheritance of fecundity in poultry, to which some notable contributions have already been made. Two definite and clear-cut results have already come to light. These are:

"First: that the record of egg production or fecundity of a hen is not of itself a criterion of any value whatsoever from which to predict the probable egg production of her female progeny. An analysis of the records of production of large numbers of birds shows beyond any possibility of doubt that, in general, there is no correlation between the egg production of individuals and either their ancestors or their progeny".

"Second: that, notwithstanding the fact just mentioned, fecundity is, in some manner or other, inherited in the domestic fowl. This must clearly be so, to mention but a single reason, because it has been possible to isolate and propagate from a mixed flock 'pedigree lines' or strains of birds which breed true, generation after generation, to definite degrees of fecundity".

This interesting conclusion was reached after the failure of a long-continued experiment to increase the egg-production of hens by simple "mass selection". As to the real solution, Pearl thinks the capacity for high egg production is inherited through the sire rather than the dam, experiments having shown that high egg producing hens and low ones produced daughters having the same grade of egg productivity, when mated to the same cock. If this be the true result, it is obvious that poultrymen should seek above all to secure cocks from strains noted for their high egg records and obtain hens from these cocks for high egg production. Pearl further attributes the fecundity of the breeds of fowl studied by him to three distinct Mendelian factors, one of which is sex-linked. The study of sex-linked characters—that is characters which are transmitted through the male to half of his grandsons, or through the female to her sons, etc., is being carried on at the station along many lines.

INBREEDING

Pearl proposes to measure the degree of inbreeding of any individual algebraically, by calculating the possible number of ancestors in previous generations and comparing this number with the number actually found in the animal's pedigree. By the use of some such accurate measurement as this (which is described and illustrated in bulletins 215 and 218 of the Maine station) a further study of inbreeding will be much more practicable, and should throw light on one of the most fundamental and debated problems of practical genetics.

That a certain amount of inbreeding is advantageous in the maintenance of blooded stock is now generally admitted; than an excessive amount is dangerous is also pretty widely believed. Pearl, like a great many other genetists, thinks the question of degree, in itself, is of secondary importance, the real question being the quality of the animals inbred. The Maine station has issued the following counsel to breeders:

"That a mating of such close relatives (as brother and sister or parent and offspring) will surely result in disaster is one of the carefully nursed superstitions of breeding, which has often been exploded but will doubtless always be with us. It may be said that all the evidence which may be gleaned from the experience of stock breeders indicates that the results which follow inbreeding depend entirely on the nature of the individuals bred. If one inbreeds weak animals, lacking in constitutional vigor, and carrying the determinants of undesirable qualities in their germ cells, the offspring resulting from such a mating will undoubtedly be more nearly worthless than their parents. If, on the other hand, one inbreeds in the same way strong and vigorous animals, high in vitality and carrying the germinal determiners of desirable qualities, there may be expected a corresponding intensification of these qualities in the offspring. The time has come when a vigorous protest should be made against the indiscriminating condemnation of inbreeding. If should be clearly recognized that if the experience of stock-breeders extending throughout the world, and as far back as trustworthy data are available, means anything at all it plainly indicates that some degree of inbreeding is essential to the attainment of the highest degree of success in the breeding of animals, poultry forming no exception to this rule".

At the Massachusetts station the poultry department is using both fowls and ducks in an endeavor to get as much genetic information as possible, the principal point under consideration being the inheritance of fecundity. An investigation is also being carried out on the inheritance of hatching power of eggs, of comb form, color and color patterns, shank feathering and rate of growth. Some of the latter researches parallel those that have been made by Bateson, Davenport and other investigators, the Massachusetts station desiring to confirm or apply their results, and to find satisfactory interpretations for the new facts observed.

Influence of management and feeding on vigor of germ in hen's eggs has been investigated in West Virginia. The data already in hand indicates that chicks are less vigorous when hatched from eggs laid by hens which have been laying heavily for a long time.

TO PRODUCE WHITE EGGS

By crossing suitable breeds, the Maryland station has undertaken to produce a breed of general utility fowl that will lay a white shelled egg. The superior market value of the white egg over that with a brown shell is well known; and although the preference seems to be wholly irrational, breeders must be prepared to meet the situation. Unfortunately the breeds that lay white eggs are, as a rule, small and ill adapted for marketing. It should be possible to transfer the capacity to produce white shelled eggs (which seems to be a Mendelian character) to a breed that will also make good "broilers". It is this task which the Maryland station has undertaken.

GRADING UP THE SCRUBS

The grading up of a flock of scrub fowl is being carried on in a systematic way at the North Dakota station, by the use of Plymouth Rock males. Such a method of improving live stock has long been in use among cattle breeders, but the precise results to be expected when it is followed by poultry breeders are not so well known. The experiment is planned to yield information on this point. A carefully recorded experiment in grading up western range Merino sheep is also on foot.

A NEW BREED OF FOWLS

Rather striking success has been produced in the Rhode Island station's study of inheritance in poultry. "The aim of this study has been to produce 'barring' as a result of crossing pure-bred black with pure-bred white fowls; and then to ascertain whether the manifestation of barring can be accounted for by any known methods of inheritance". A Barred race has actually been produced; it is evident, then, that an unsuspected factor for barring is carried latent in the germinal constitution of White Leghorns, the white parent used in the experiment.

Inheritance of egg weight is also being tested, the data appearing to show that any individual fowl lays eggs which vary only slightly from a certain average weight. Comparison with the record of the mother indicates that the weight of an egg is a character which is actually transmitted from one generation to another; the observers are now trying to find out how.

The inheritance of egg production is a subject for study in New Jersey, where an attempt is being made on an adequate scale to breed a strain of fowls that will vindicate the genetist's claim that he can control this character. In this connection the question of close inbreeding is being studied. At present, the experiment is being run on two lines, one dealing with birds of high capacity and the other with low producers. It is by interbreeding these two lines that light is sought on the problems of heredity. General studies of inheritance have also been undertaken by the

WOMAN'S WORLD

DUNHAM HOMEMAKERS' CLUB

THE April meeting of the pioneer Homemakers' Club of Quebec was held in Dunham on April 18th at the home of Mrs. J. L. Gilberts, with a good attendance. The president, Mrs. J. F. Yates presided. Report of the last meeting was read by the Secretary, Miss E. L. Baker, and adopted. Sympathy was expressed and extended to Miss Campbell, demonstrator, who was suffering from an attack of typhoid. A resolution of condolence to Mr. H. Lewis on the death of his wife, Mrs. E. Lewis, was adopted, and sympathy was also extended to the sister, Mrs. G. Bates. The Dunham Homemakers' Club feel that they have lost a true co-worker and friend through the death of Mrs. Lewis.

Mrs. G. W. Wilkinson was appointed delegate to the convention to be held at Macdonald College in June. A press correspondent was appointed to report to the official organ of the Club, "The Canadian Home Journal", and to the "Journal of Agriculture" and "Sherbrooke Record."

The subject of school competitions was then discussed and a committee was appointed to consult with the teachers, endeavouring to introduce a system of needlework along practical lines in the rural schools.

Miss Alice Martin donated a most finely executed sponge cake, which spoke of the high culinary art of that household. This cake was made to demonstrate the high quality of potato flour. All partook of and enjoyed this fine cake. The Club were very grateful to Miss Martin for the effort and interest shown, and would be pleased to see more of the young ladies of the town interested in matters of the Club.

Next month the subject of pruning will be dealt with by a demonstrator from Macdonald and a social tea will be given by the ladies of the Club at the home of Mrs. Wilton.

HARRIET J. GILBERT,

Press Correspondent

PREVENTION OF MOTH DAMAGE

THE various substances used to keep away moths, such as tobacco, camphor, naphthalene cones or balls, tarred paper, and cedar chips, have no effect if the eggs are already present in the clothes. Entomologists in the department therefore recommend a thorough beating, shaking, and brushing of all articles likely to attract moths before they are laid away for the summer. The brushing of garments is especially important in order to remove eggs which may have escaped notice. If the articles are quite free from eggs or larvae when laid away, the odor from the various repellants already mentioned or from cedar chests and wardrobes will serve to keep the moths away. This odor, however, lessens with age, so that the protection it affords is greatly decreased after a few years. For this reason when furs and other valuable garments are wrapped in tarred paper or placed in sacks of tarred paper these containers should be renewed every year or two.

FOODS AND FOOD PREPARATION

Lesson XV

The Summer Supply of Meat on the Farm

THE question of the meat supply in our country homes during the hot months of summer is a vexing one for many housekeepers. The old system which has prevailed for so many years of depending almost entirely on a supply of salt pork, salted or cured when the animals are killed in the fall, is still the only one followed in many districts, but for various reasons it is failing to satisfy on the whole. The increased cost of meat generally makes the farmer of the present day feel more like turning his prime hogs into dollars and cents when ready for the market. Another reason is that. as our standards of living are tending toward a higher plane, the monotony of a pork diet during the hot weather does not appeal to our palates, particularly if we have some knowledge of food values and are aware that pork, being more difficult of digestion than the other meats and provided with a larger average percentage of fat, which is heat producing, is not a desirable food to be used exclusively when the mercury hovers near the 90° mark.

For these reasons housewives are looking to other sources to supply the necessary meat element. Eggs are largely used on the farm during the summer and should be, as they are both easily digested and nutritious. Poultry is perhaps not used in proportion to the supply, since the farmer's wife rears for the market and expects her poultry yard to furnish a considerable portion of her income. Hence, a fine spring chicken is a luxury not be indulged in too frequently.

For those who live near our many fresh water lakes and rivers fresh fish can, and should be used when obtainable.

Nevertheless, in spite of eggs, poultry, fish and the ham and bacon of which most households will have a certain supply, there will yet be many days when the meat dish must be fothcoming from some other quarter. Beef is the meat most extensively used though why, with our facilities for growing it, mutton should not share the honours, is a somewhat puzzling question. However, let us consider the feasibility of serving beef on our tables during the summer. The winter offers little difficulty to us here in Canada as it is possible to utilize the material in the big snow drift at our door and keep our meat securely packed and frozen, bringing it in and cooking it at our convenience. It is during the summer that the trouble occurs, since it is impossible, even with an ice house, to keep fresh meat for any length of time.

The following are some suggestions for overcoming this difficulty.

I. *Preserving meat*
  1. Canning.
    (a) In glass jars as vegetables and fruit are canned.
    (b) In stone jars by the aid of partial cooking and the use of fat.
  2. Salting or Corning.
    (a) Dry.
    (b) Pickling.
  3. Smoking,—with or without salting.

II. *Supplying Fresh Meat*
  1. By means of a "Beef Ring".
  2. By means of a Municipal Cold Storage Plant.

Canning—

(a) In glass jars as vegetables or fruit.

This method would be best adapted to the rougher parts of beef or to the round.

Recipe for Canning Beef

Cut up beef 1 inch thick and in good sized slices, as it shrinks in the canning. Take shin bones,

---

crossing of White Leghorns and Black Langshans, interesting facts about the source of barred pattern and the inheritance of black pigment having already come to light.

From the Utah station, Director E. D. Ball writes:—

"By breeding fowls, we are attempting to determine the possibility of improvement of the laying qualities of hens by continuous selection. In order to accomplish this it was considered necessary first to establish what the original laying capacity of an unselected flock of hens really was, as study of all of the records available did not seem to throw very much light on this question. Most of the records have been based entirely on the first year production, and the first year production as is shown in our Bulletin 135, appears to be a very poor indication of the laying capacity of a given individual or of a given strain of fowls.

Therefore, the first object sought was to keep a sufficient number of flocks of unselected fowls under as near as possible normal conditions, to determine through a series of years what production could be normally expected from a flock and what the range of variation due to seasonal influences, individual differences, etc., really was. Bulletin 135 contains a summary of this work to date. It will be continued for some time in order to get still more accurate data and especially to determine the actual longevity and laying period of the White Leghorn hen.

PERIODICAL EGG RECORDS

This year's records, which are not included in this bulletin, are strikingly confirmatory of the general results. The records this year under identical care and attention of last year have fallen almost to the poor record of 1911, while every indication up to date is that next year's record will again be a good one, more forcibly illustrating the periodicity in production. We have in manuscript at the present time a detailed study of the winter egg production of these same flocks of hens in an attempt to determine whether there is any possibility of discovering a Mendelian factor, as is claimed by the Maine Station. We have been unable to find any Mendelism in the inheritance of this characteristic. Taking the records of hens from three to seven years and comparing them, we find that the individual fluctuates up and down in the same way that the flocks do, and that our winter egg production is even more variable than our total, that entire flocks have produced as low as 15 to 17 eggs in the first winter and from 35 to 40 the second year. According to Dr. Pearl's conclusion, it would seem that they must have acquired the high laying unit the second year. A third portion of this bulletin will take up the possibilities of improvement by selection,—it is, of course, only a preliminary study as it will be necessary to carry on the work many years to obviate seasonal variations and to select strains. We have, however, been able materially to modify productions by strain selection based on three years or more of production, and tested by an equal amount of production in the offspring."

Sex-linked characters are being traced in poultry by the Missouri Station, where they have been found particularly abundant in plumage pattern. The spangled pattern of the Silver Spangled Hamburg, for instance, is found to be sex-linked but, curiously enough, it is not transmitted as a unit for the entire body, the tail seeming to follow a scheme of distribution of its own; for in all reciprocal crosses, the tails of the Fl. Birds are solid black. A correlation between the hen feathering characteristic of male Sebright bantams, and diminished fertility, is being sought by a series of bantam crosses.—*Journal of Heredity.*

cover with water and boil until the liquid will jelly. Strain and set aside until set. Have jars sterilized. Pack in the meat, with a teasp. of salt and some pepper. When the jar is half full, put in two large tblsp. of the firm jelly. Fill up with meat. Put on the covers with the rubbers. Do not screw tightly. Put in a boiler, allowing the water to cover about 2-3 of the jar. Boil three hours. Then remove and screw tops tightly.

Note:—Always put a little fat meat in the jar, because the fat when cool forms a layer on top and insures perfect exclusion of air.

To Can Chicken

Pluck and clean thoroughly. Leave fowls in water (into which a handful of salt has been thrown) over night. Cut fowls up, joint leg bones at main joint, again cracking in the centre.

Treat wings in same way. Take out side and breast bones. Cut meat off breast as closely as possible. Take the frames that are left, joint up and place in the stew kettle. Cover with water and boil until the liquid, when cooled, will jelly slightly. Flavor the liquid with salt and pepper (a little onion juice may be used if wished) and strain through a sieve. Have jars and covers sterilized. Pack meat (some of each part) in jars, putting liquid from the bones to the top and put on the covers, not tightly screwed. Have the boiler ready fitted in the racks and enough water (cold) to cover two-thirds of the jars. Set in the jars and let them come to the boil, and boil two and one-half hours. Take jars out and allow them to cool. If bottles are not full, uncover and fill to the top with remaining liquid. Dip rubbers into the boiling water. Put both rubbers and tops on the jars but do not tighten. Put them on to boil again and when the contents of jars have come to a boil, take them off and screw the tops tightly *at once*.

Note:—To sterilize jars, wash and fill with cold water. Set in a pan on a cloth and surround with cold. Heat gradually to boiling point.

Still better results can be secured in canning beef by using what is called "fractional sterilization" where instead of giving the long boiling on only one day, the meat is boiled for an hour on each of three successive days, the jars being allowed to stand in a warm place between boilings. The reasons for following this method are that bacteria, which are the chief cause of spoiling, are sometimes found in a condition known as the "spore" stage in which they are able to resist the boiling which destroys bacteria in their ordinary state. When in the spore stage the first boiling only softens them and on favourable conditions being supplied, such as warmth, they develop rapidly. (This is a frequent cause of spoiling in the canning of vegetables). The second boiling kills the bacteria thus developed and the third still further ensures success by destroying any bacteria, which may have developed after the second day.

(b) In stone jars with fat.

Recipe for Canning in Fat

Slice the loin and side meat or any portion of the carcass desired and fry until a little more than half done. Pack the slices as closely as possible in a stone jar and cover with hot lard. As the meat is wanted for use it may be removed from the jar and warmed up. If the jar is to stand for any length of time after it has been opened without using from it, it will be best to cover the top over again with lard. It is better to use several small jars than one large one. They should be kept in a cool, dark cellar to insure safe-keeping of the meat.

This method gives excellent results with home prepared sausages and pork, has also been used with success in the canning of veal cutlets and could be used with advantage with steaks of beef. The important thing to remember is that fat tends to become rancid if kept in a warm temperature and will decompose if exposed to light, hence the absolute necessity of storing in a cool, dark place. Veal cutlets canned in the spring and used in August were as fresh and delicious as if newly prepared.

2. *Salting or Corning.*

Recipe for Corned Beef

The pieces commonly used for corning are the plate, rump, cross ribs, and brisket, or in other words the cheaper cuts of meat. The loin, ribs, and other fancy cuts are more often used fresh, and since there is more or less waste of nutrients in corning, this is well. The pieces for corning should be cut into convenient-sized joints, say, 5 or 6 inches square. It should be the aim to cut them all about the same thickness so that they will make an even layer in the barrel.

Meat from fat animals makes choicer corned beef than that from poor animals. When the meat is thoroughly cooled it should be corned as soon as possible, as any decay in the meat is likely to spoil the brine during the corning process. Under no circumstances should the meat be brined while it is frozen. Weigh out the meat and allow 8 pounds of salt to each 100 pounds; sprinkle a layer of salt one-quarter of an inch in depth over the bottom of the barrel; pack in as closely as possible the cuts of meat, making a layer 5 or 6 inches in thickness; then put on a layer of salt, following that with another layer of meat; repeat until the meat and salt have all been packed in the barrel, care being used to reserve salt enough for a good layer over the top. After the package has stood over night add, for every 100 pounds of meat, 4 pounds of sugar, 2 ounces of baking soda, and 4 ounces of saltpetre dissolved in a gallon of tepid water. Three gallons more of water should be sufficient to cover this quantity. In case more or less than 100 pounds of meat is to be corned, make the brine in the proportion given. A loose board cover, weighted down with a heavy stone or piece of iron, should be put on the meat to keep all of it under the brine. In case any should project, rust would start and the brine would spoil in a short time.

Recipe for Pickled Tongue or Corned Beef

1 gal. water.
6 ozs. sugar.
3 lbs. coarse salt.
½ oz. salt petre.

Put all ingredients into a sauce pan and boil one half hour. Remove scum. Pour pickle into crock and when cool put in meat. Let it remain from 8 to 14 days according to size. Turn every day. This pickle may be kept for six months if well boiled every two weeks.

Two rules should be observed to ensure the best results in this method.

(1). Meat must be properly and thoroughly cooled before curing. If salted before the animal heat is out the shrinkage of the muscles causes the retention of injurious gases, giving an offensive odour to the meat.

(2) Curing should be begun as soon as meat is cool and while still fresh.

Vessels.—The best vessel for curing is a large stone jar, though it is more expensive and there is danger of breakage. A suitable vessel is a hardwood barrel, either made for the purpose or a molasses or syrup barrel. A barrel or jar may be used again and again provided it is scalded out thoroughly each time before being used.

Preservatives.—Salt and sugar or molasses are the most common and the only preservatives necessary for the perfect curing and the finest quality of meat. Borax, boracic acid, formalin, salicylic acid and other chemicals are sometimes used but are considered by many authorities harmful to the health and should be avoided.

The action of salt is astringent and when used alone renders the meat hard and dry. It acts by first drawing out the meat juices, then in a few days it contracts and hardens the muscle fibre, thus shrinking the volume of meat.

Saltpetre is used to preserve the natural colour of the flesh but is considered harmful to the health if used in too great quantities. It is more astringent than salt.

Sugar softens the muscle fibres and improves the flavour.

Baking soda is used in small quantities to sweeten brine and in warm weather will keep it from spoiling.

Brine cured meats are best on the farm, since a dry curing place is not usually obtainable. It is also easier to pack meat in a barrel and pour on brine than to go over it three or four times to rub in salt and it gives a better protection from insects and vermin. There should be no difficulty in keeping if pure water is used, if it is kept in a cool, moist cellar and closely watched during warm weather. Sometimes the sugar or molasses has a tendency to ferment.

Dry corning is accomplished by rubbing into the meat salt in the following proportions—1½ lbs. salt to ½ oz. saltpetre. Rub in until the meat can take no more then put in a cold place in a crock and turn every day.

Smoking is often used after salting or pickling and is simply the exposing of the meat to smoke fumes which close the pores to some extent, exclude the air and prevent attack by insects. Smoking necessitates a special house which may be built of brick, stone or wood, about 6 x ft. in area and, to give the best results, 8 or 10 ft. high. Ventilation must be supplied (by small openings under the eaves or a chimney) in order to prevent overheating the meat. Green hickory wood is best though maple or apples tree wood may be used or even corn cobs. Meat should be taken from brine two or three days before being hung and may be washed in tepid

A Class of Senior Girls in the Experimental Kitchen, School of Household Science, Macdonald College.

water to prevent a salt crust forming. It should be hung so that smoke may circulate freely around each piece. If fire is kept going steadily, 24 to 36 hours should be enough for one lot of meat. During the spring a light fire may be started every second or third day for two weeks, the meat being allowed to hang until sufficiently coloured. Keep the house dark to exclude flies. When sufficiently smoked, cool, and when hard and firm wrap in paper and place in a bag. Borax may be dusted over the meat or a lime whitewash with glue in it, applied outside the bag.

11. *Supplying Fresh Meat.* — This is a big step in advance of canning and curing and as yet the movement is in its infancy. The reasons for fresh meat being preferable to canned or cured meat are obvious. Fresh meat is more nutritious and palatable and is capable of being cooked and served in a greater variety of ways. Canned meat must either be jellied and served cold, or stewed. If in fat, it may be sauted or fried but the method has certain disadvantages in the medium employed. Corned or cured meats must be boiled.

The question of fresh meat has been solved in many parts of the country by the establishment of a "Beef Ring." This is an example of one way in which co-operation can be of a very great advantage to the farmer. "Beef Rings" have been established in the west (Manitoba) and in Ontario.

The organization may comprise from 16 to 40 members, each representing a family or, where the latter is small, two families may go in together. The average ring consists of about 20 members and begins operations about May 1st. lasting about twenty weeks, each member providing one animal during that time. For a ring of this size the animals slaughtered should weigh from 750 to 800 lbs. dressing to about 400 lbs. thus giving each member about 20 lbs. per week. The meat is so cut that each family gets a boiling piece, a steak and a roast each week. In organizing such a ring the members should meet and arrange all details before starting operations. Such questions as that of the standard of meat supplied (age, etc.) arrangements for slaughter of animals, delivery for killing, (if done at one settled place), and delivery of meat after cutting up must be decided upon. A proper butcher should be employed, meat allowed to hang in a cooler for some time before being cut, and delivery made under sanitary conditions, as in a clean cotton bag supplied by members.

This is one of the most satisfactory and successful ways of securing fresh meat during the summer and where operated has secured to the members a better grade of meat and greater variety than can be obtained from any country butcher and many town ones.

Where this idea has not been introduced and a trial is desired it would be possible to start with a smaller group of members for a part of the season and supply fresh lamb, mutton, veal or pork. In this case there would be less meat to dispose of. Or an animal might be killed less frequently, once every two weeks, or once a month, which would still ensure a certain amount of variety in the meat course.

The last suggestion is a more advanced one, that of a municipal abattoir and refrigeration plant. Co-operation is taking hold in the rural districts and if we have our co-operative cheese factories, creameries, rural laundries, etc. why not a co-operative butcher shop where not only fresh meat could be supplied but where the curing of meats could also be attended to? This would not only settle the difficulty of securing a fresh meat supply and a uniform quality in cured meats, but if under proper inspection would ensure the best conditions for care of animals just previous to slaughtering, for the actual killing, and the proper cooling and treatment of meat afterwards, all of which factors are most important from the points of flavour, keeping qualities and sanitation.

That there are problems to be met with and difficulties to be overcome in establishing such a plant is inevitable but there seems to be no reason why these should be insurmountable. Having the meat properly inspected would be one such problem.

Where meat factories have been established for the curing of meat for export from the country the Federal government provides thorough inspection and no meat is allowed to be sent out until marked "approved." If inspection such as this could be applied to municipal plants it would be a great step forward in the meat question. The importance of proper inspection cannot be overestimated. Domestic animals are subject to many diseases some of which are difficult of detection, and even the more obvious ones can be hidden or the diseased parts removed by an unscrupulous butcher so as to deceive all but an expert. Official reports of abattoirs where inspection is in force show that a great number of diseased portions of meat are thrown out each year in addition to whole carcasses which for various reasons are refused approval. Diseased meat is not fit for human comsumption and no methods should be too difficult or too costly if its distribution can be prevented. In the country districts where there is no inspection at all this danger is very apparent. The municipal abattoir would seem to be a means to remedy this. Further, besides securing fresh meat of a good quality to its patrons, it can employ methods to utilize the by-products of the butcher shop and thus help to make the enterprise a self-supporting or even a paying one. Bones can be converted into bone meal, fats purified and prepared for the market, waste materials prepared and sold as fertilizer so that by the elimination of waste often present in the small or private slaughter house the larger plant in time should pay for its installation in dollars and cents as well as in the better health and increased efficiency it secures to the community.

BESSIE M. PHILP,

Macdonald College

THE HOMEMAKERS' CLUB AND THE RURAL SCHOOL

THE 20th Century has been called the Woman's Century, owing, no doubt, to the remarkable advancement lately made by women in practically every department of the world's work. This movement, which is an evolutionary one based on economic conditions, is making most rapid strides, and women are realizing more clearly every day that their opportunities for work are unlimited. The great increase in the number of women's organizations and the subjects undertaken by them show this very plainly. Not only are our women eagerly availing themselves of every opportunity for broadening their own personal horizon (a matter that cannot fail to influence greatly the future of the race) and seeking to improve conditions in their own homes, but they are widening their sphere of influence to include community affairs, affairs of the state and affairs of the world at large. This is only a natural consequence of a broader intelligence applied to home affairs, since directly or indirectly the home is affected by every question of common interest whether immediate or remote. Women's organizations have made their way more slowly in the rural districts of Canada than in the cities and towns, but the seed has taken root and in rapidly growing numbers clubs are being formed among the women of the farm and village. These clubs find no lack of subjects for investigation and study. The lot of the farmer's wife has long been looked upon as one of toil and comparative isolation. Many recent improvements are tending to ameliorate this condition, such as the rural telephone, better transportation facilities, etc., so that at the present time there ought to be sufficient leisure for her to consider questions outside of herself and the four walls of her home. Homemakers' Clubs should see to it that their attention is not entirely confined to purely domestic matters. Study affairs of the community and see what can be done to improve it. No thoughtful woman will need to look far. In church matters women have always been active and no doubt will continue to be, but in other community affairs there is less co-operation. One at least is greatly in need of such co-operation—that is the rural school. The rights and welfare of the child are so intimately connected with that of the woman that if this be woman's century it must also be the child's. Did it ever strike you that by some strange juggling of affairs we seem to be putting the cart before the horse in the rural districts? What conclusion could an observant traveller arrive at in going through our well-to-do farming communities? He would see the cultivated fields, the best type of fencing, the latest improvements in machinery, specially constructed and up-to-date stock barns, in short all the evidences of thoughtful application of the discoveries and inventions of agricultural science in the production of crops and the feeding, housing and rearing of high class stock—all well and good and worthy of admiration and emulation. But what is this bare little building of weather beaten brick or dingy coloured wood set down in a corner by the roadside, devoid of attraction, with grounds more or less unkempt and rough? Oh, that is where the rural boys and girls spend their time when they are not doing chores, raking hay, picking potatoes, or doing any other of the thousand and one things children can do on the farm. Their fathers and mothers went there before them and the schoolhouse has changed very little since. Is it, too, up-to-date? Is it correctly lighted? Has it a workable system of ventilation? Is it furnace heated? Has it toilet facilities? Are there provisions for the manual arts and for games? Is there a place for the children to eat their lunch, etc., etc? The average member of the community would probably wonder if you were crazy should you ask such questions as these. They would tell you that the school is all right, it is soundly built, it has windows on both sides for plenty of light, there is the big box stove to heat it in winter. Don't they remember how they used to sit around it when the thermometer dropped below zero and wait until the room thawed out so that they could go to their own seats? "Ventilation? Why, we opened the windows in warm weather, when it was cold we did without", and so on.

What is the logical conclusion? The latest thing in science for our stock and crops, the conditions of a quarter of a century ago for our children. Are the latter, then, of less value to the farmer, the community and the state? Judging by what one often sees, they appear to be, yet we know that really the children of any country are by far the most valuable of its assets. They are the citizens of to-morrow with untold possibilities for good or evil with physical, mental and moral capabilities all awaiting development.

BESSIE M. PHILP.

(To be continued)

THE CHILDREN'S HOMER. II

The Adventures of Odysseus. IV

WHILE Odyseus slept after his ship-wreck, Athena went to the Phaeacian city upon whose shore he had hidden. She went to the king's palace, to the chamber where the king's daughter, the Princess Nausikaa, slept. Athena appeared in a dream to the Princess, warning her that soon it would be time for her to wed, and bidding her take all her beautiful linen to the river to wash it, that it might be ready for the bridal day.

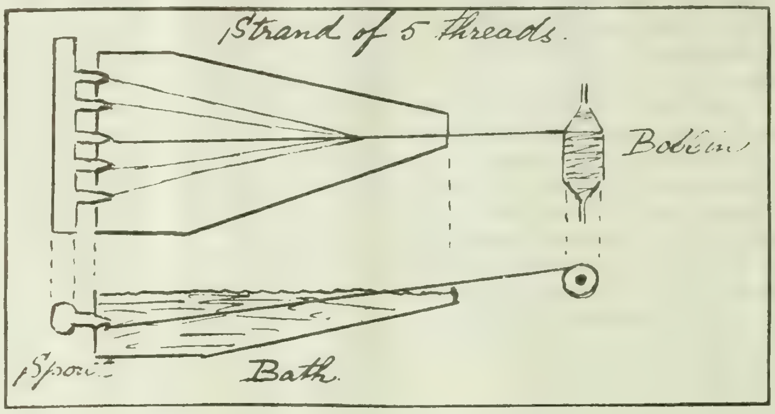
OF GENERAL INTEREST

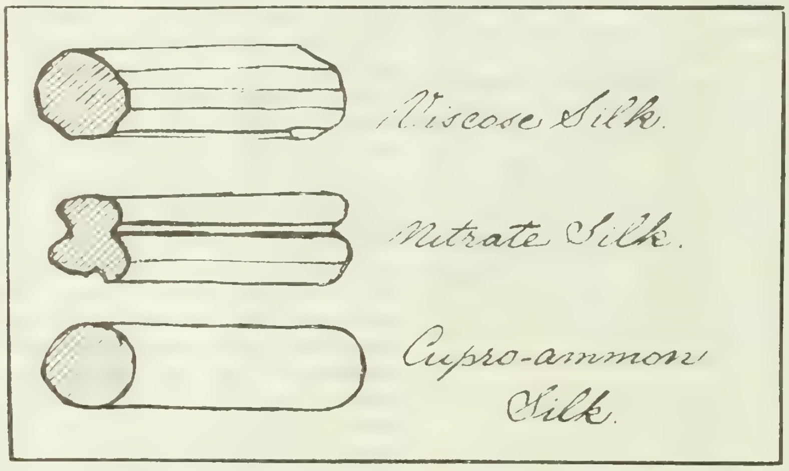
ARTIFICIAL SILK

MANY centuries ago the Chinese were aware of the splendid wearing qualities of silk and as far back as 2400 B.C., steps were taken to encourage that industry. Later the silk industry was introduced into Japan and Europe. The production of silk is simple but expensive, and the use of silk is still a luxury. A short account of how silk is produced may be in place here.

The eggs of the silk worm are hatched out artificially at the time when the mulberry trees are covered with young tender leaves, which serve as food for the larvae. The worms grow rapidly, consuming large quantities of leaves. For example, one ounce of eggs will give 35,000. silk worms, eating a ton of ripe leaves and producing 12 lbs. of silk. From these figures it is evident that we need vast orchards of mulberry trees to supply all these young leaves, without killing the trees.

After thirty days the worms are full grown and spin their cocoons of silk. This silk is contained as a liquid in the body and is spouted out through five openings. The material hardens as soon as it comes in contact with the air and the worm shapes the thread by slightly pulling at it.





It takes the worm four days to complete the cocoons. Then the cocoons are steamed to kill the chrysalids, the gum is washed out and the cocoons are reeled off, five to twenty being taken together to make one strand of silk. The average length of thread on each cocoon is about 700 yards and the yearly silk production is approximately 110 million lbs.

The high price of silk has induced inventors to imitate, using cheap materials. The resulting product looks like silk, but has unluckily none of its sterling qualities, which after all determine the value of silk. The first patent was taken out in 1885 and imitates the action of the silk worm and the present methods only differ in details. Ordinary wood pulp is treated chemically and nitrates are formed and these nitrates are dissolved in ether-alcohol. The liquid is spouted out under water through very fine glass jets. The liquid hardens at once and is pulled through the reservoir. As in the case of silk, a number of these threads are twisted together and these strands are used for spinning. More recently, two other processes have been invented, in which the methods of rendering the cellulose of wood-pulp (or cotton) soluble, differ materially from the nitrate process. In one the raw material is treated with an ammoniacal solution of a copper salt. In the other, the wood-pulp is treated first, with caustic soda, then with carbon disulphide. The product is a thick viscous liquid which readily forms threads when pressed through the narrow openings into a salt solution. This last mentioned process is much cheaper than the original one and will replace it altogether in course of time. It is known under the name of the "viscose" process.

In the following table is given the cost price of the different imitations:—

Nitrate cellulose, $1.50.
Cuprammonium cellulose $1.20.
Viscose, $0.80.

They sell all three for two dollars against four dollars when the real silk is required.

Artificial silk is much thicker than real silk thread and, as a result, garments made of the imitation are less pliable and do not produce the characteristic rustle of silk. Then the imitation silk does not wear very well; it is too weak and has to be strengthened with other materials. But really the biggest objection to artificial silk is that you must prevent it from getting wet. As soon as it gets wet the threads swell up and you can tear the fabric with your hands.

How important that difference is, can be seen in the figures below:

	Strength	
China Silk	dry 53	wet 47
French Silk..	" 50	" 41

When Nausikaa awoke, she did not tell her dream, but begged her father to let her go with her maidens to the river, saying she wished to wash her own and her brothers' clothing.

Her father refused her nothing, but commanded the servants to bring the mules and the wagon. Her mother helped her place all her rich clothing on the wagon, and added a lunch for her and her maidens, and so they set off, a merry flock of girls, for the river.

When they had reached the river bank, they washed the clothing, treading it out in the sweet, clean water, with their bare feet, in the old way of washing. They spread the linen to dry along the shore, and while they waited played a game of ball. One of the maidens missed the golden ball, at her turn, and it flew out into the deep water of the river. The girls all cried out at this, and their cry waked Odysseus.

Wondering, he looked out from his hiding-place, and saw the group of maidens. Hungry and desperate, he knew that he must get help from them, so, covering himself with boughs of the trees, he came out, more like a wild beast than a man, his hair and beard tangled and white with salt water, his clothing gone. The girls were frightened when they saw him, and ran in every direction, all except Nausikaa who stood bravely, looking at him.

Odysseus spoke gently, asking her whether she were mortal maid or goddess, so fair she seemed to him. And he told her how he had been shipwrecked, and begged her to give him clothing and food.

Nausikaa answered with courage and dignity, telling him who she was, what city her father ruled, promising to help him all she could, since his need was so great. Then she called back her maidens, and bade them give Odysseus oils to cleanse himself of the salt water and clothing from her brothers'.

Shyly the maidens obeyed her, and when Odysseus had bathed and dressed himself, and they had given him food and wine, he seemed a different man, so noble and mighty in his bearing, yet so gentle and courteous, that Nausikaa admired him greatly, and wished in her heart, that if she were to have a husband, he might be like Odysseus.

Then she and her maidens drove back to the city, and she told Odysseus to follow them after a time, when she had had a chance to tell her father of him. She bade Odysseus come straight into the palace, past her father's outer court, to where her mother sat, and make his plea for help to her, for Nausikaa knew, in her wise maiden's heart, that her mother would pity Odysseus, as she had.

So when Odysseus came, the Phaeacian king and queen received him kindly. Odysseus did not tell them his name, nor did they ask it, but showed him every kindness, just because he was a stranger, needing help.

Next day, the Phaeacians held a council, and agreed to aid Odysseus with ships. After the council came a feast, and then games, in which Odysseus showed his great strength in hurling the weights. Then the bard sang of the the great war between Greece and Troy, and his words so moved Odysseus that tears came to his eyes.

The king noticed how the bard's song affected his unknown guest, and was curious to know why. He asked him then his name and history, and Odysseus consented to tell all that had happened to him in the years since he had left Troy. We shall hear in his story why Poseidon was so angry with him, and would not suffer him to cross his kingdom, the sea, in safety.

MARGARET GRAY.

French Silk dyed black and weighted 110%	" 12	" 8
French Silk dyed black and weighted 500%	" 2	" 1
Nitrate Silk	" 16	" 3
Viscose Silk	" 22	" 13
Cotton	" 12	" 19

We learn from this table that the strength of artificial silk in a dry condition is fairly good, although only about one third of the strength of real silk, but as soon as the threads become wet, they collapse altogether and lose four-fifths of their strength. This fact makes artificial silk useless for garments unless strengthened with other materials, but for decorations, trimmings etc. articial silk is used extensively and in some cases exclusively, because such goods are not subjected to any strain.

In the table also is shown the weakening effect of weighting silk threads with insoluble salts and in case of artificial silk being weighted the differences are still more striking. In some cases where the thread can be made much heavier a core of cotton. is used which is covered with artificial silk. Then we have a thread with the outward appearance of sik, which when moistened becomes stronger. It is possible to recognize artificial silk by burning a thread of it. In case of a silk a heavy black residue remains and at the unburned part of the thread little balls are formed. Artificial silk burns quickly, leaving practically no residue behind. When we put the different threads under the microscope, we observe that viscose silk is of a regular angular structure; nitrate silk is irregular showing longitudinal stripes, and cuprammonium silk is smooth and round.

Woodpulp is used in all these processes and its value increases considerably when manufactured into artificial silk, as will appear from the following figures:

	Value
Woodpulp	$7.00
Changed to paper	12.00
Changed to artificial horsehair	370.00
Changed to artificial silk	700.00
Changed to fireproof artificial silk	1200.00

Besides imitation silk, the same solutions produce many other imitations, artificial horsehair being one of the most important. Further, mantles for incandescent light are made of it as its quality to burn without residue is a real necessity. The production of artificial silk is increasing steadily at present, the yearly output at present is fifteen million pounds and as soon as the product is a little more improved, the industry is bound to expand enormously.

J. VANDERLECK.

LENGTH OF LIFE IN BEES

THE worker-bee rarely lives longer than 45 days during June, July, August and September; while those emerging from their cells in September may live until the next May or June, if not injured by our winters, their life being prolonged above the 45 days in proportion to the work that they do or the hardships they are required to undergo. It is unlikely that a worker bee would survive a single year. When proper conditions are not complied with, the colony is thrown out of balance, and the bees perform any office of the hive feebly until they can adjust matters. Then it is that very young bees go into the fields and they will bring less than one-half the load that the bees over 16 days old will carry. Old bees will rear queens which are not of half the value of those reared when there are plenty of nurse bees, as is the case when a colony is in a normal condition; and some workers will even lay eggs. These eggs laid by worker bees give nothing but drones. As these worker bees are not what we call fertile, nothing but drones can come from their eggs, any more than from an unfertile queen. While queens reared by old bees will become fertile and lay for a time, their life is short. It has been found that queens under the most favorable circumstances attain the age of three, four, and often five years, even under the great stimulus which is brought to bear on them under modern beekeeping, where a queen is often coaxed to lay more eggs each year than did the queens of our fathers. Many queens at the present time lay from 3,000 to 4,000 eggs daily; while in the day of the box hive, if a queen laid from 2,000 to 2,500 eggs daily she was doing remarkably well. As a rule, neither all old bees nor all very young bees rear queens unless some accident happens to force them to do so. It is not a good plan to adopt the accident policy if one wishes to rear queens which will tend to produce better bees than those we already have.

The worker bee is in the egg form three days; in the larval form, five or six days and in the pupa form twelve days. After emerging it takes the bee from a half to a full day to get fully straightened up, soon after which it begins preparing chyle for the larvae of the hive, doing this work very largely until it is from six to ten days old, when, if the weather is pleasant, it comes out of the hive for the first time to void the accumulated excreta, and to mark the location of its home, still continuing its work inside of the hive, such as feeding the brood, building comb, evaporating nectar, capping the brood and honey, etc., until it is sixteen days old, when it goes out to labor as a field bee, after which, if the colony continues in a normal condition, it does very little of the inside work, and dies of old age from 25 to 30 days later. While these bees that are over 15 days old can be forced, through being made queenless, to prepare chyle and rear queens, still queens so reared will work after about the same order as will the workers at field work, when forced out after honey and pollen when only five or six days old. Therefore, in all work for increase outside of natural swarming, it is well so to form a colony that bees of all ages will remain with each part of any division made.

The drone lives a very precarious life; for at any time, when a scarcity of honey prevails, and the bees are not fed by the apiarist, the drones are unmercifully driven from the hive, sometimes being killed by the workers. Under favorable conditions the life of the drone is nearly the same as that of the worker. To queenless colonies, drones are of greatest importance until they can get a young laying queen. There is another thing about drones that is very rarely spoken about, and that is that they are what is sometimes called "commoners". In other words, they have the privilege of entering, unmolested, any hive that allows its own drones to remain, and if they are driven from one hive they are allowed to enter another which is retaining its drones. Hence if some choice drones are being kept in a queenless colony for mating queens after all other drones are killed off, it is well to have such a colony in an isolated position.

CONTINUATION SCHOOLS IN FARMING

AN important link has been added to Wisconsin's educational chain.

It is the County Short Course in Agriculture which has been patterned after the first short course ever given in this country,—that started in 1885 by Dean W. A. Henry at the College of Agriculture of the University of Wisconsin.

It is expected that such courses will be given this year in all or many of the 11 counties which have county agricultural representatives, the work being under the direction of these men. A year ago five of these "continuation schools in agriculture" were attended by 74 boys, who supposedly, in common with a great majority of the rural school children, had finished their schooling.

The course consists of two winter terms with the intervening summer spent in home project work under the supervision of the county agricultural representative. The instructional work is given in agricultural subjects definitely related to the work of the farm. Students satisfactorily completing the course are granted certificates by the Regents of the University.

CARE OF THE WOODLOT

FOR some ten years the Dominion Government has been aiding the farmers of the prairie provinces to plant windbreaks, and otherwise improve their farms by planting of trees. Of late years there has been a considerable demand from eastern Canada for information in regard to the care of woodlots, and this year the Dominion Forestry Branch issued a circular of sixteen pages dealing with this matter. The leaflet is the work of Mr. B. R. Morton, B. Sc. F., one of the officers of the Branch who has had considerable experience in dealing with woodlots in eastern Canada and who is in charge of this work. The pamphlet discusses the object of the woodlot, protection, grazing, fires, improvement cutting, thinning, reproduction, natural seeding, artificial seeding, planting, time to plant, distance apart, sprout or coppice method, number of pounds of seed required to the acre for seeding, number of plants required per acre for different methods and distances of plating. The circular is illustrated by a number of engravings which show the methods of carrying on the work. Those desiring to improve their woodlots may obtain a copy of the publication free of charge by applying to the Director of Forestry, and requesting a copy of Forestry Branch Circular No. 10, Care of the Woodlot.

APPLICATION AND CARE OF FARM MANURES

(Summary of a recent Publication (Circular 49) of the Indiana Agricultural Experiment Station), by J. C. Beavers

WHEN properly cared for, the manure from a well-fed horse is worth $14.75 per year; from a dairy cow, $18.75; from other cattle, $11.60; from a sheep, $2.25, and from a hog, $2.10. At present only a few farmers are obtaining these manure values because the manure is not made under proper conditions or well cared for.

Over half the total fertilizing value of the manure (solid and liquid) is contained in the urine; therefore every reasonable precaution should be taken to prevent its loss.

The loss from leaching during three or four months may range from one-third to one-half the original fertilizing value of the manure. By using impervious floors and by keeping the stock well bedded, leaching may be prevented.

Fermentation may destroy one-half the organic matter and one-third or more of the nitrogen if permitted to go on unchecked for four or five months. It cannot be prevented but may be held in check by keeping the manure moist and thoroughly compacted so that air cannot penetrate the mass.

In order to obtain the greatest return, manure should be applied to thin sandy and clay soils rather than to those soils already rich in organic matter. It should be used on soils where the organic matter, as well as nitrogen, phosphoric acid and potash will be beneficial.

As a rule, in general farming, manure should be plowed under for corn or applied as a top dressing on wheat. The rotation of crops, the relative value of manure on different crops, and the convenience of the farmer should be carefully considered when deciding upon a system of usage.

(To be continued)

INDEX, JULY 1914 TO JUNE 1915 (Inclusive)

TABLE OF CONTENTS

A

Accounting, National Co-operative Farm.. 110
Advice for the Farmer.. 225
Advice for Farmers, Ancient.. 96
Agriculture of Province of Quebec, Council of.. 93
Agriculture in Compton County.. 51
Agriculture in Pontiac County.. 5
Agriculture in Ontario Schools, The teaching of.. 117
Agriculture in the Rural Schools of Ontario.. 80
Agriculture, Publications on.. 1
Agriculture the basic industry.. 166
Agricultural College Education for the Farmer's son.. 24
Agricultural conditions in Huntingdon County ..54, 250
Agricultural Co-operation.. 68
Agricultural Co-operation in Wisconsin.. 138
Agricultural Council of Quebec visit Macdonald College. 96
Agricultural Instruction at the Provincial Exhibition... 77
Agricultural Merit Competition, 1915 ..205, 225, 245
Agricultural Progress.. 166
Agricultural Situation in Quebec.. 139
Agricultural Values in 1914.. 213
Alfalfa demonstration plots in Quebec.. 145
Alfalfa Seed production in Quebec.. 229
American Association of Instructors and Investigators in Public Health.. 39
Andalusians, standard weights for.. 86
Annual Report of Minister of Agriculture, Ottawa..... 96
Apples and Apple growing, A word about.. 187
Apple Maggot or Railroad Worm, The.. 169
Apple Trees, Amount of spray required for.. 227
Army worm in Pontiac, The.. 50
Auction Sale.. 36
Aylmer School Fair.. 107
Ayrshire Breeders' Association, Annual Meeting of Canadian ..175, 197
Ayrshire cattle, Uniform scale of points of.. 103
Ayrshire cows and heifers, record of performance test 81, 127
Ayrshire Herds, Visits to.. 198
Ayrshire men banquet .. 198
Ayrshire records, Official Canadian.. 81
Ayrshires, The McArthur sale of.. 198
Ayrshires sell well at "Springburn".. 236

B

Back-to-the-Land movement, The.. 7
Bacon industry in the Province of Quebec.. 9
Bacteria and dairy farming.. 37
Bacteriology of Canning, The.. 72
Banks for Farmers, Co-operative.. 69
Bedford Notes, District of.. 250
Bees, The wintering of.. 72
Bees, Foul Brood of.. 249
Big difference, A.. 38
Big problem and a novel suggestion, A .. 25
Birds, Feed the winter.. 169
Birds, Insects and .. 169
Bordeaux Mixture.. 207
Brains into farming, Put more .. 163
Breed, A new.. 16
Breeding stock, Auction sale of.. 80
Breeds, New standard.. 86
Broilers, marketing in Quebec.. 16
B.S.A.'s from Macdonald College, New.. 3
Buildings, How to erect small concrete.. 254, 255
Bugle Blast to Canada, The.. 249
Butter and Cheese, Inspector appointed of the weighing of.. 14
Butterfat plus overrun equals butter.. 82
Butter, List of prizes obtained at Ottawa for.. 105
Butter, reason for the Quebec success at Toronto...... 82
Butter-makers at Toronto, Great victory of Quebec.... 82
Butter-makers, Well done Quebec.. 69
Butter-making and its development in Eastern Ontario.. 128

C

Cairnside picnic, The.. 29
Calf, Do not neglect the young.. 102
Calves, Raising.. 217
Camembert cheese in Canada, The manufacture of.... 14
Canadian engineers inspect concrete roads.. 44
Candling of Eggs, The.. 64
Canning, The bacteriology of.. 72
Canning of Fruits and vegetables, The.. ..86, 89
Capon production.. 130
Cement, Questions about.. 194
Cereal crops on the Experimental Farms .. 214
Cereal Husbandry Department, Macdonald College 1914, Notes on the.. 30
Cheese-factories be inspected, Should farms selling milk to .. 239
Cheese, Gift to Great Britain by Quebec Government of. 82
Cheese in England, Quebec.. 60
Cheese, Quebec.. 179
Chemistry, Some basic principles of agricultural.. 152
Chicken thieves.. 40
Chicks, Hatching the.. 220
Chicks in incubator, Hatching.. 200
Chicks lightly, Feed .. 257
Chicks, Little.. 220
Children's Homer, The .. ..19, 41, 66, 88, 109, 132, 162, ..223, 261, 262
Christmas season, This.. 115
Clods, Beware of .. 205
Clover and Grass Seeds.. 234
Clover seed, Home-grown.. 56
Clover seed production, Red.. 97
Clover, Sweet.. 153
Clydesdale importation, A.. 58
Colt, The care of the.. 126
"Come, let us live with our children".. ..223, May IX
Commodity prices are easier.. 117
Compton County, Agriculture in.. 51
Compton County, Agricultural progress in.. 150
Compton County, Homemakers, Clubs in.. 108
Compton County School fair.. 77
Compton County, Signs of the times in.. 54
Concrete cellar steps and hatchways.. 79
Concrete Fence posts.. 123
Cookery exhibit at Granby fair.. 87
Cooking, Score cards for judges of.. 88
Cookshire Short Course in Agriculture.. 215
Co-operation.. 53
Co-operation among farmers.. ..74, 225
Co-operation, Progress in.. 238
Co-operation in Quebec, Progress of.. 185
Co-operative movement in Denmark, The.. 20
Corn, Methods and rates of planting.. 233
Corn production, Ensilage.. 230
Corn, The cultivation for.. 252
Cost reducers.. 16
Cottonseed Meal.. 124
Country School, Justice for the.. ..113, 133
Cow, a distinctive.. 83
Cow, A 30,000 lbs. dairy.. 157
Cow, A profitable type of milch.. 235
Cow, Champion of the world.. 10
Cow, Estimating the value of a.. 45
Cows give most milk, Comfortable.. 164
Cow's Individuality, The.. 241
Cows test? What do your.. 241
Cow testing .. 176
Cows that wear well.. 38
Cowansville Rural School fair.. 106
Creek, Water supply from.. 194
Cream to any percentage of fat, How to reduce.. 83
Creameries and cheese factories, disinfection of.. 14
Crops, The season's.. 246
Crops, Condition of the .. 96
Crops that give several profits.. 165
Crops in 1915, Greater and better.. 193

D

Dairy Cattle, Breeding.. ..May, 1X
Dairy, Cleanliness in the.. 14
Dairy Commissioner, Report of the.. 128
Dairy farmer in Eastern Canada, Outlook of the.. ..159, 180
Dairy herd, building up the.. 154
Dairy herd, Developing a.. 81
Dairy Industry, Annual Convention of the Quebec Society of .. 199
Dairy Industry Law, The new.. 239
Dairy record centres.. 60
Dairy School winter course, St. Hyacinthe.. 128
Dairy Cows, Summer feed for.. ..253, 254
Dairy Cattle, Molasses for .. 254
Dairy Shorthorn in Canada, The.. 34
Dairying, Substantial progress in.. 91
Dairying, Winter.. 127
Dairyman, The "single-crop" .. 156
Dairymen imitate the month of June, Successful .. 179
Dairymen, Rations fed by Ohio and Wisconsin.. 177
Demonstration houses.. 16
Demonstrator, The work of the County.. 139
Denmark, The rural schools of.. ..93, 117, 141
Denmark, The co-operative movement in.. 20
Differences, Some.. 257
Disinfection of creameries and cheese factories.. 14
Drought, Lessons from the.. 1
Ducks, Fattening .. 131
Ducks and Geese, Dressing .. 131

E

Eastern Townships of Quebec and the Immigration question .. 1
Eclipse engines.. 42
Edouard, Death of Father.. 1
Education, Report of Commission of Technical, 49, 93, ..117, 141
Egg Circles, Co-operative.. 63
Eggs for incubation, The selection of.. 181
Eggs, More winter.. 160
Egg-laying ability is inherited.. 17
Eggs, preserving in water-glass .. 17
Eggs, Preservation of.. 220
Egg-production, Breeding for .. 202
Eggs, Quality in.. 39
English layers.. 16
Ensilage corn production.. ..212, 230
Erosion, loss of soil by.. 25
Evenings, The long winter .. 91
Ewe and lamb, Care of the.. 102
Ewes, Spring management of breeding.. 236
Excursions, Farmers'.. 226
Experience not enough, One man's.. 55
Experimental Farms Report.. 237

F

Factories and armaments.. 138
Fairs, Rural school.. 91
Farm advertising.. 23
Farm milk prices in United States.. ..256, 257
Farmers, co-operation among.. 74
Farm, Labour on the.. 92
Farm Home contest, Scale of points in a.. 66
Farm Labour and Weeds.. 234
Farm production, Increase our.. 91
Farm Produce, Upward Trend of Market Prices of.. 245
Farm Losses.. 173
Farm Weeds.. ..135, 146, 172, 191, 231
Farmer's Son, An agricultural college education for the 24
Farmer, Two types of.. 116
Fattening crate, to make a.. 85
Fattening means profits.. 83
Fattening record, Macdonald College.. 85
Feathered friends, Protecting our.. 163
Federal legislation affecting agriculture.. 47
Fertilizers, Effect of the war on.. 100
Field husbandry experiments.. 5
Field root and vegetable seed situation.. 235
Flax, Cleaning and grading seed grain and.. 233
Flies in the stable.... 33
Floriculture, Seasonable notes on.. 27, 95, 168
Foods and Food Preparation.. .. 18, 40, 65, 108, 131, 161, 162, 183, 221, 243, 259, 260, 261
Food Products (New Book).. 161
Food Products, The source, chemistry and use of.. 66
Flour mills old and new, The country.. 68
"For all we have and are".. 110
Forest planting in Quebec.. 170
Foot and Mouth disease.. ..115, 126
Front-page illustration.. 139
Fruit Crop, The.. 72
Fruit Culture in the province of Quebec.. 72
Fruit growing in Quebec, Progress in.. 120
Fruit growers' convention.. ..26, 49
Fruit industry, Our.. 168
Fruit, Marketing and distribution of.. 188
Fruit, Over-production of.. 225
Fruit prospects, Quebec.. 3
Fruit reports.. 51

G

Garden Notes for July.. 4
Geese, Noodled.. 130
Genetics, Poultry 258, 259
Gigault, The Death of Mr. G. A.. 245
Goodlooking farms.. 23
Granby fair, The cookery exhibit at.. 87
Grain recommended by the Dominion Cerealist, Varieties of.. 189
Gray Nun's barn at St. Laurent, The.. 238
Great Britain, A magnificent gift to.. 82
Green crops for sheep and lambs.. 33
Grinding, Power for.. 8

H

Hemp nettle.. 100
Hens, a house for laying.. 16
Hens lay more often, Variety of foods makes .. 182
Hen, To set a sitting.. 202
Heredity as an influence in milk production.. ..57, 89
Hogs are profitable raised as a side-line.. 164
Hog-raising profitable, When is.. 237
Holstein bull, A great.. 12
Holstein-Friesian cows, Official records of..13, 35, 128, ..158, 178, 218
Home economics, Macdonald College short course in... 183
Homemaker's Club, Dunham .. 259
Homemakers' Club and the Rural School, The.. 261
Homemakers' Clubs.. 183
Homemakers' Club at Canterbury.. 18
Homemakers' Club at Eardley.. 18
Homemakers' Club at Lennoxville.. 40
Homemakers' Clubs in Pontiac.. 64
Homemakers' Clubs in Richmond County.. 162
Homemakers' Clubs in Stanstead County.. 162
Honey, Producing the best grade and marketing.. .. 4, 51
Horse Breeding, Federal assistance to.. 175
Horse labour, Inefficient use of.. 156
Horticulture, Free short course in.. 142
Hot beds and cold frames.. 208
Household science, Progress of.. 2
Housekeepers, Little talks to.. 184

Howick Ayrshire breeders, Among the 31
Howick school fair 107
Hunting spirit in the air 43
Huntingdon country, Agricultural conditions in 54
Huntingdon Dairymen's Association 219
Huntingdon district, Agricultural progress in 149
Huron country, Ont., A rural survey of 92
Hydraulic ram 56
Hymn before Action 67

I

Ice crop, Harvesting the 174
Ice harvest, The farmer's 173
Ice-house, The construction of an 67, 173
Illustration farm selected, owned and worked by Mr. Thomas McDowell, of Shawville, Que 8
Immigration question, Eastern Townships of Quebec and the 1
Incubation and Brooding, Artificial 242
Individual fair play 15
Inquiry, The story of an 252, 253
Insects and birds 169
Investing farm profits 115
Irrigation for the market gardener 3
Isolation of farm life, The 90, 110

J

Judges of Field Competition crops in training 100
Journal of Agriculture.—Lists of Subscribers to the 245

K

Keeping milk records, Benefits of 257
Kitchen gardens, Plans for 209, 210
Kitchen ironware, Ways of cleaning 162
Klinck leaves Macdonald College, Professor 24
Klinck's successor at Macdonald College, Professor 116

L

Lamb, the market 125
Leghorns, Standard weights for 86
Legislation relating to Agriculture, New 205
Lennoxville Farmers' Club 151
Lennoxville Homemakers' Club 86
Lime in agriculture 232
Lime-sulphur spray 207
Lime, When soils need 253
Live-stock Breeders' Association, Metropolitan 157
Live-stock situation in the province of Quebec 154
Litter, Management of the fall 110
Live Stock stock-taking, A 139
Locusts in Eastern Canada 253

M

Macadamised roads in repair, Keeping 47
Macdonald College Third Year examination results 42
Macdonald College, New B. S. A.'S. from 247
Machine-milking a failure in Quebec, Is 179
Machinery, Care of the 44
Male birds after the breeding season, Importance of the removal of 17
Manures for farm crops, Liquid 233
Manures, Farm losses in 164
Manures, Protect the 137
Maple grove, Possibilities of a modern 21
Maple products, Co-operative sales of 248
Maple Sugar Makers' meeting 145, 167
Maple sugar producers, Resolutions of 193
Maple sugar Schools 23
Maple sugar season approaches, The 185
Maple sugar and Syrup Co-operative Agricultural Association 28
Maple sugar and syrup, Practical advice to makers of 213
Maple sugar and syrup for the Canadian wounded 226
Maple sugar sand 193
"Maple" to mean pure maple 118
Marketing, Better methods of 206
Marmalade now! Make your 183
Massachusetts Agricultural College, A trip to 28
Meat, Table of information about cuts of 243
Megantic County farmers at Macdonald College 7
Men well satisfied 38, 62
Milk and Cream in the home, Suggestions regarding care of 218
Milk cans and bottles, Cleansing 199
Milk due to cow not feed, Rich 83
Milk, How feeds affect the keeping quality of 128
Milk per acre 14
Milk production, Economical 62
Milk production, Heredity as an influence in 57, 89
Milk shipped to Montreal, The 139
Milk supply of Montreal, The 159
Milk supply, Suggestions for the improvement of Montreal's 179
Mistress Mary Shakespeare and her famous son 109, 136
Mortar, The making of 173
Mother's duty to her child, A 131
Moth damage, Prevention of 259

N

New Book 215
New England, Through 23
Nitro cultures 214
Nitro culture benefit non-leguminous crops 249, 250
Noon hour at school, The 204
Noodled geese 130
Notes 246, 247
Nurseries, Quebec provincial 170

O

Ontario Agricultural College, The 24
Ontario Entomological Society, Annual meeting of the 120
Ontario Vegetable Growers' Association Convention 118
Opportunity and our duty, Our 165
Orange rust on raspberry leaves 28
Orchard and garden, Care of the 205
Orchard insects, 1915 247, 248
Orchard Demonstrations 248
Orchards, Intercropping young 248
Orchards, Renovation of neglected 145
Orchards, Tillage or sod mulch in 73
Orchards worth while, Are 166
Orient, Trade with the 67
Origin and distribution of wheat, The 21
Ormstown spring show, The 11
Ormstown, Two noted stock farms at 56
Ottawa county school fairs 106
Our lads to the front 90
Outlook, The 130
Ox Warble, The 255, 256

P

Panama-Pacific exposition, The live-stock Building at the 104
Parental sympathy, Wanted 112
Parks, Canadian national 68
Patriotism and production 165, 232
Phosphate fertilizer 51
Planting table 210
Plowing a neglected art 79
Poems, Two Christmas 133
Poisin, Cut worms killed by use of 248, 249
Pontiac County, agriculture in 5
Pontiac County, Agricultural progress in 149
Pontiac County, Homemakers' Clubs in 107
Pontiac County, Household science extension work in 107
Pontiac Wool Association, The 1
Population in Eastern townships and Ottawa Valley, Drift of 2
Pork produced cheaply on pasture 254
Potash and wood ashes 195
Potash, supply of 152
Potatoes, Care required in storing 118
Poultry exhibits, Improving 62
Poultry, Free short course in 105, 167, 181
Poultry houses, Demonstration 257
Poultry Husbandry, American Association of Instructors and Investigators in 39
Poultry house prints 17
Poultry industry, The farmer and the 160
Poultry keepers, A word to 105
Poultry needed, More 241
Poultry notes 40, 62, 83, 201
Poultry outlook 130
Poultry trade meeting 181
Poultry properly, To kill 85
Poultrymen, Convention of 63
Price level unchanged, General 26
Prices slightly downward 3
Prices for milk paid Farmers in 1914, Average 257
Profits, Good 241
Producers, A word to Canadian 70
Public wants, What the 37
Pump for distant well, Stable 122
Pumping from river to stables 122
Pure-bred sire, The value of a 20

Q

Quack grass 16, 44
Quebec apple sections, A visit to some 26
Quebec buttermakers! Well done 69
Quebec Dairymen must wake up 49
Quebec fairs, 1914 43, 67
Quebec Pomological and Fruit-Growing Society, Annual summer meeting 71
Quebec Seed Growers' Co-operative Association 234
Quebec Society for the Protection of Plants 187, 228
Queen of the dairy world, The 10
Queer replies by farm students 113

R

Ram not lifting water properly 152
Rams and boars by the Federal Government, Distribution of 56
Raspberry and strawberry, The 228
Rats, Destruction of 163
Readers and Contributors, To our 139
Record of Performance test 14, 81, 127, 199, 238
Red Cross appeal to the farmers 227
Rented farms 115
Reports received 145
Rest, A period of 241
Richmond county, Harvest notes from 55
Ropy Milk 60
Rooster, Swat the 39
Root field, In the 29
Root seed production 98
Root and vegetable seed situation, Field 235
Roots 214
Rotation of Crops 164
Rural credits 165
Rural life, A satisfying 226
Rural Schools, Agricultural instruction in 246
Rural school, The 164
Rural school fairs a success 85
Rural Schools of Ontario, Agriculture in the 80
Ruralising the cities 1
Rust, Protecting farm implements from 173

S

Sale, for 235
Sampling reveals, What 83
Santa Claus and Little Billee 133
Saunders, Death of Dr. William 69
School Gardens, United States 227
School boy "howlers" 113
School Fairs, A danger in 245, 246
Score card for dairy farms 240
Seasonable hints 237
Seed grain, Fifth provincial exhibition of 145
Seed grain and flax, cleaning and grading 233
Seed growing from vegetables 119
Seed improvement in the province of Quebec in 1914 211
Seed in Canada, Production of registered 121
Seed law, The 252
Seeds, Supplies of farm and garden 95
Seeds, weeds and feeds 174
Shade trees, The planting and care of 118
Shawville school fair, Household science exhibit at 86
Sheep breeder, Fall hints to the 102
Sheep Breeders' and Wool Growers' Association 235
Sheep, Facts about 81
Sheep husbandry 235
Sheep in Canada, Deplorable scarcity of 157
Sheep in Compton County 216
Sheep industry, Encouraging the 48
Sheep-killing dogs 33
Sheep Breeders' and Wool Growers' Association 235, 254
Sheep raising May XI
Sheep and swine at Sherbrooke 90
Sherbrooke Fair, The 23, 75, 88
Sherbrooke County, Agricultural conditions in 150
Sherbrooke County Agricultural Society 250, 251
Shingles, 173
Short courses in Agriculture and Farm Home at Macdonald College, 118, 141
Short Course in Horticulture at Macdonald College, 142 167
Short courses, The Macdonald College, 165, 170, 183, 190
Silk, Artificial 262
Silage, Handling 79
Silage is dangerous, Feeding of mouldy 217
Silage the best succulent fodder for winter 45
Silage, The place for 178
Silo-filling accidents, How to avoid 80
Silo, How to obtain contents of a 45
Simple sidewalk construction for the farmer 22
Siphon, Lifting water with a 79
Sire, The value of a pure bred 20
Six months' hoist, A 14
Smut, Treatment against 192
Social Service congress 47
Sod vs clean cultivation in the orchard 227
Soil fertility 116
Soil management in relation to yield and quality in seed 122, 151
Soils, Weed seeds in soils 252
Sows, Winter management of brood 196
Spraying apple-trees; amount of spray required 227
Spraying campaign for 1915 207
Spring, The notes of 205
Spring Outlook in Richmond County, The 250
Spring work 205
Stable pump for distant well 122
Standing crop competition 210
Steadman Homemakers' Club 107
Stock Breeders' Association, Annual Meeting of Quebec General 176, 216
Stock Breeders' Association, Fifth annual sale 102
Stock, Rearing the young 257, 258
Stock, Conserve the breeding 175
Stock, The growing 242
Saock Feeds, Condimental 256
Stockman of the future, The 111
Strawberry culture 209
Strawberry pest, A 72
Subscribers to the Journal of Agriculture, List of 225
Sugar Makers' Meeting 118
Surface cultivation 45
Surface water in well 55
Surface water out of driven well, keeping 79
Swat the rooster 39
Sweet clover 153
Swine 177
Swine feeding 157

T

Takes the backache out of housework 42
Tank, A concrete water 173
Technical education, Report of the Commission on 49, 93

..117, 141
Tide and the flowing well, The.. 100
Tillage or sod mulch in orchards .. 73
Tomatoes, Indoor.. 50
Tradition, Rebels against.. 69
Trees and lightning.. 112
Troughs of concrete, Durable and sanitary.. 103
Tuberculosis. An experiment with. 83

U

Unemployed and the farmers: An Appeal. The war, the 70
Unemployed on farms, The.. 91

V

Vegetable Growers' Convention, Ontario.. 118
Vegetables, Seed growing from.. 119
Vegetables, The storage of.. 94
Vermont Sugar Makers' Meeting.. 194
Vision, The.. 115

W

War, (Poem) .. 67
War and agriculture.. 47
War, The causes of the.. 92
War, education and agriculture in the province of Quebec, The.. 147
War, The farmer and the.. 206
War prices in Canada.. 92
War taxes, The new .. 185
War, Unemployed, the farmers and the.. 70
Water, Drinking.. 234
Water from well to kitchen Pumping.. 100
Water in cellar.. 55
Water from brook to kitchen, Lifting.. 8
Water with a ram, Lifting.. 79
Water with a siphon, Lifting.. 79
Water supply from creek.. 194
Water supply from spring.. 8
Water supply for house.. 100
Waterloo Women's Club.. 18
Wax rendering .. 95
Weeding, On.. ..May IX
Weeds, Farm.. ..135, 146, 172, 191, 231, 251, 252
Weeds, Farm labour and .. 234
Well, The tide and the flowing.. 100
Well, keeping surface water out of.. 79
Well, Surface water in.. 55
Western Ontario, Impressions of a trip through.... 30
Wheat Crop, 1914.. 56
Wheat in Canada, No shortage of.. 213
Wheat, The origin and distribution of.. 21
Whey used in the preparation of Sausages.. 105
Wife, The Farmer's.. 90
Wild wheat.. 185
Winter dairying .. 127
Wool Growers' and Sheep Breeders Association, The district of Bedford.. 254
Wool clip, The 1914 .. 9
Wool, Co-operative marketing of.. ..195, 216
Wool growing, Encouraging.. 13

Y

Yamaska Valley, Co-operative Agricultural Society of... 195
Year Books, Two statistical.. 163
Yellow, What makes milk and butter.. 38

ILLUSTRATIONS

Abbotsford town hall.. 71
Alfalfa, Grimm and ordinary.. 229
Alfalfa plot on farm of Mr. Marsellais.. 146
Alfalfa in seed, A sheaf of.. 230
Alfalfa set out in rows for seed.. 229
Alfalfa seed, Harvesting with a clover-seed attachment. 97
Apple-maggot, Diagram of life-history of the.. 169
Apple trees, Spraying.. ..227, 228
Apple picking.. 120
Army worm, The.. 50
Ayrshires on Burnside stock farm, Howick, P.Q., Group of 32
Barns of Mr. Oswald Cuthbertson, Maple Ridge, Pontiac Co.. 5
Barns of Mr. W. Hodgins near Portage du Fort, Large stock.. 7
Barnyard of Mr. Thos. McDonald, near Shawville, Pontiac Co.. 5
Beef, Top and bottom round of .. 222
Beef, Blade and chuck rib cuts of.. 244
Beef, Delmonico steak.. 222
Beef, Porterhouse steak.. 222
Beef, Chuck and skirt steaks.. 244
Beef, Prime rib roast.... 222
Beef, Round bone sirloin steak.. 222
Beef, Side of.. 222
Beef, Texture of.. 221
Birds and insects on the farm, diagrams showing relations of 170
Bird's Nest, The. A Kindergarten Scene.. 223
Board form for casting slabs. A simple and convenient. 22
Bladder Campion, a common perennial weed in Meadows. 251
Byer's orchard at Abbotsford Dr.. 71
Calves, Good summer treatment for.. 102
Canada Thistle 172, 231
Canning of fruits and vegetables.. 87
Capon placed on caponising table.. 130
Capon, The end of the operation.. 130
Capons, well fattened and dressed for market.. 131
Careful cultivation gives good crops.. 4
Carrot, Wild.. ..146, 232
Cattle parade, Lining up for the big.. 75
Celery seedlings transplanted.. 210
Celery, Young seedlings of.. 209
Cellar hatchway, Concrete.. 79
Chaddock and his Plymouth Rock pullets, Mr. E..... 63
Cheviots at Macdonald, A group of.. 125
Chicory has blue flowers, and a thick tap root which makes it difficult of eradication.. 251
Chick in the shell, a full formed.. 201
Chicks, One thousand baby.. 202
Chicory.. 137
Clover-seed harvesting attachment.. 97
Cold frame set on the ground.. 208
Concrete feeding trough.. 103
Concrete fence posts.. 124
Concrete Poultry House, A.. 255
Concrete Wall Sonstruction, Sectional Form for.. 255
Cookery exhibit, Diagram showing enclosure.. 88
Corn, Dent varieties.. 212
Corn, A field planted by the check-row method.. 230
Corn, Flint varieties.. 212
Corn, germination box for the ear test.. 212
Corn, right and wrong way of buying ensilage seed.... 212
Corn, Wisconsin No. 7.. 212
Corn field in Huntingdon district, Prize-winning.. 150
Corn-shocker used by Mr. J. A. McClary.. 53
Couch grass.. 136, 191
Countess of Afton.. 57
Cowansville School Fair, the Poultry section.. 106
Cow testing charts.. ..176, 177
Cream. Diagram for calculating how to mix.. 83
Cromwell M.P., Home of Fred.. 53
Dandelion .. 172
Demonstrators, Macdonald College — Frontispiece, January.
Devil's Paint Brush.. ..137, 232
Duncan's barns, Mr. J.. 33
Eastern Townships sheep, A group of.. 34
Eclipse engines.. 42
Eaton River valley near Cookshire.. 52
Eggs for incubation 181, 182
Eggs, fertile.. 201
Eggs, Infertile.. 201
Egg-tester for candling eggs.. 200
Entrance to Macdonald College grounds.. 142
Ewes at Sherbrooke Fair.. 76
Farm buildings, Mr. R.R. Ness's.. 31
Farm home attired in its winter garb, A cosy.. 204
Farmers' excursions from Megantic county to Macdonald College.. 8
"Favorite Tone".. 57
Fleece, A rack which ensures a clean.. 196
Fleece, Conditions which tend to the accumulation of dirt and chaff in the.. 195
Foods and Food preparation.—Asparagus salad.. 18
  Beef, cuts of.. 221, 222, 244
  Moulds, jellied .. 18
  Salad bowl, the.. 19
  Sliced tomatoes.. 18
Fruit, Exhibition at Pomological Society meeting.. 143
Field Bindweed, a most troublesome perennial with cropping rotts and twning stems.. 251
"Fyvie Time".. 57
Gigault, Mr. G. A.. ..186, 245
Gibb, Home of the late Charles.. 71
"Golden Vine" peas, broadcast.. 30
"Golden Vine" peas, drilled.. 30
Graduating class in agriculture, Macdonald College.— Frontispiece, July.
Grain in growing oats—value of pure seed.. 101
Grey Nun's barn at St. Laurent.. 238
Hard Hack .. 137
Harrow, The double cutaway disc.. 231
Harrowing a close stand of swedes, Result of.. 29
Hardback or Steeple Bush, a common weed in clearings and some pastures.. 251
Harrowing roots before thinning.. 29
Hemp nettle.. 101
Holsteins.. ..56, 57
Horner at Radford, Cosy home of Mr. John.. 5
Horse allowed to walk without reins or lines.. 157
Hot bed.. 208
Hydrangeas.. 168
Ice-house, concrete.. ..61, 62
Illustration farm of Thos. McDowell, near Shawville.... 9
Incubator with its newly hatched chicks.. 201
Jars containing preserved fruits.. 87
Jelly bag, Pattern for.. 65
Jelly-making device.. 65
Judges of Field Crop competition in Quebec.. 101
King of the yard and pride of the table. — Frontisp., Dec.
"King Sergis Pontiac Alcartra".. 12
Klinck, Professor L.S... 25
Lamb's quarters.. 146
Lamb, rib chops of.. 244
Lefebvre, Charles and William.. 52
Lefebvre's cornfield, Cookshire.. 52
Lunch spread on desk.. 204
Lunch spreadon desk.. 204
Macdonald College exhibit, Sherbrooke Fair.. ..76, 77
Mangels of well-bred strain.. 99
Mangels at Macdonald College, Seed-bearing.. 100
Mangels and swedes at East Farnham.. 210
Manure, Wastage of.. 138
May is the month of Apple-blossoms. — Frontispice, May.
"May Rilma", a Guernsey, champion cow of the world. 10
McClary, Hillshurst, Mr. J. A.. 53
McIntosh, Cookshire, Mr. D.. 53
Megantic County excursion enjoying lunch in the shade at Macdonald College.. 8
Milking machine in use.. ..179, 180
Mill on the Chateauguay River, The old.. 94
Montreal musk melons.. 119
Murray, B.S.A., Mr. James.. 147
Mustard, Common .. 172, 231
Ness's farm buildings, Mr. R.R... 31
New B. S. A.'S.—The 1915 Graduating Class at Macdonald College.. 247
"Norine", Holstein cow.. 235
Oats, Demonstration of the value of pure seed grain in growing .. 101
Oats, Hugh Tannahill's field of.. 54
Onions, Well-thinned.. 209
Ox-eye daisy .. 191
Paint Brush, Devil's.. 137
Parker, Lennoxville, in field of mangels; Mr. J. M... 211
Pen used at Macdonald College as winter quarters for brood sows.. 196
Percheron brood mares, a popular breed in Quebec.— Frontispiece, February.
Piggery at Macdonald College, The.. 10
Pigs at Sherbrooke Fair.. 76
Pigs, Tamworth-Chester White cross-bred.. 111
Pig weed.. 136
Plantain, Narrow-leaved.. 147
Ploughing a neglected art.. 79
Plymouth Rock pullets, Mr. E. Chaddock's.. 63
Pontiac County, Some of the school boys of .. 106
Poultry on the way to market, A carload of live.. 85
Poultry fattening batteries.. 84
Poultry, Well fattened.. 84
Purslane .. 172
Prices for the entire United States in cents ped quart at farmers' shipping stations, Average monthy.. 256
Quebec City, View of Dufferin Terrace and lower town. Frontispiece, August.
Quebec Government Nurseries, Berthierville, P. Q... 170
Quebec Govrenment plantations, Lachute, P.Q. .. 170
Quebec Pomological Society meeting, members at the.. 71
Rack for feeding grain and roots.. 216
Raymond, Cookshire, Mr. A.E... ..52, 53
Rib-grass.. 147
Rib-grass or Narrow-leafed Plantain, a tap-rooted perennial, with its seed.. 251
Roots, Good seed.. ..98, 99, 100
Salads.. 18, 19
Seed Roots 98, 99, 100
Santa Claus and Little Billee.. ..133, 135
Seed Roots, Harvesting and selection of — Frontisp. Novemb.
Senior Girls in the Experimental Kitchen, A Class of.... 260
Sheep, Eastern Townships.. 34
Sheep sorrel.. 173
Shepherd's Purse.. 146
Sherbrooke and the Exhibition grounds.—Frontisp. September.
Sherbrooke exhibition. Lining up for the big cattle parade 75
Short Course in Horticulture at Macdonald College.... 207
Short Course lecturers, The Macdonald College.. ..171, 221
Shorthorn bull owned by F.M. Cromwell, Cookshire. — Frontispiece, October.
Sidewalk construction.. 22
Silage corn in Quebec, A fine field of.. 156
Silo with mixture of oats and vetches, Filling.. 53
"Sir Spencer".. 75
Skinner irrigation system in use.. 4
Smut of Oats. Oats sprinkled with formalin .. 192
Smut of Oats. Oats left covered with sacks.. 193
Sow thistle, Perennial.. ..146, 192
Spray plant.. 208
Spraying apple trees.. 227, 228
Spraying fruit trees with lime sulphur mixture before the buds open.. ..Frontispiece, April.
Spraying orchard with lime sulphur by means of a gas motor engines.. 27
Stairway, A concrete.. 76
Sugar Camp at Foster, Que., Visitors' Day in the — Frontispiece, March.
Swedes, A good selection of.. 99
Swedes, A poor selection of.. 100
Tannahill's Field of oats, Hugh.. 54
Tamworth-Chester White crossbred pigs.. 111
Team at Shawville fair 1913, Agricultural.. 149
Team at Shawville fair 1913, Roadster.. 149
Tomato blight; use Bordeaux mixture.. 3
Tomato plant, A well grown .. 208
Turnip experiments at Shawville, Results of.. 211
Turnip harvester, A useful.. 76
Turnips at Macdonald College, Students loading.. 127
Three Typical Representatives of Dr. Harwood's Holstein Herd forming a Judging Class for Senior Students of Macdonald College.. ..Frontispiece, June.
Tying Forms with Wire to Prevent them from Spreading, Method of.. 255
Wash boiler for sterilising, A tin.. 87
"White Chieftain of Cottage Hill" .. 32

CONTRIBUTORS

Armitage, W. S.. 251

Barton, H.. 234564
Barton, H... ... .57, 89, 125, 155
Bergey, S. A.. 40
Boving, P. A.. .. ..30, 54, 76, 100, 120, ...153, 170, 191, 215
Bunting, T. G.. .. ..207, 227, 228, 248

Campbell, Miss F.. ..19, 41, 66, 86, 107, ...109, 132, 162, 183
Chapais, J. C.. 188
C. F. W.. 257

Dawes, A. J.. 96

E. A. L.. 250
Editorials, ...1, 2, 3, 5, 23, 24, 25, 26, 31, 32, 48, 49, 69, 70, 71, 72, 91, 92, 93, 96, 115, 116, 117, 118, 139, 140, 141, 145, 159, 165, 166, 167, 185, 186, 205, 206, 225, 226, 228, 238, 239, 245, ...246, 247, 248, 249
Emberley, G. E.. 194

Fisher, Miss K. A.. 87
Fixter, J.. 9

Garland, J. P.. 240
Gilbert, Harriet J.. 259
Gorham, A. C.. .. ..207, 208, 209
Gray, Jessie D.. 83
Gray, Margaret .. ..20, 42, 66, 89, 109, ...133, 162, 223, May IX, 262

Hammond, H. S.. 101
Hodge, C. H.. .. ..55, 250
Husk, R. E. 54, 150, 250
A. H.. 131

Jones, Harry W.. .. .. ..5, 51, 73, 95, 249
Jowsey, H. B.. 107
Jull, M. A.. ..16, 17, 63, 85, 86, 130, 131, 181, 182, 201, 202.. 257

Keenan, Margaret P.. 18
King J. K.. 149
Kruse, Miss F... .. ..224, May IX

Laird, Sinclair 118
Lefebvre, J. H.. 28
Lynde, C. J.. ..8, 56, 79, 100, 122, 152, ...173, 195
W. L.. .. ..6, 28, 136, 147, 169, 173, ...192, 193, 232, 252

Maw, W. A.. .. ..243, 258
McClintock, L. D.. 110
McDougall, W. G.. .. ..150, 236
McLaurin, A. E.. 197
McLennan, A. H.. .. ..4, 28, 50, 51, 94, ... 119, 209, 210, 248
MacMillan, A. A.. .. ..10, 34, 102, 126, ...196, 217, 236, 254
Miller, H. B.. 251
Moore, C. S.. .. ..216, 233
J. E. M.. 31
J. E. McO.. 80

Ness, A. R.. .. ..103, 254
Newman, L. H.. 122
Nicholson, Miss E.. 220
Nicholson, Miss L.. .. ..220, 242

Philp, Bessie M.. 261

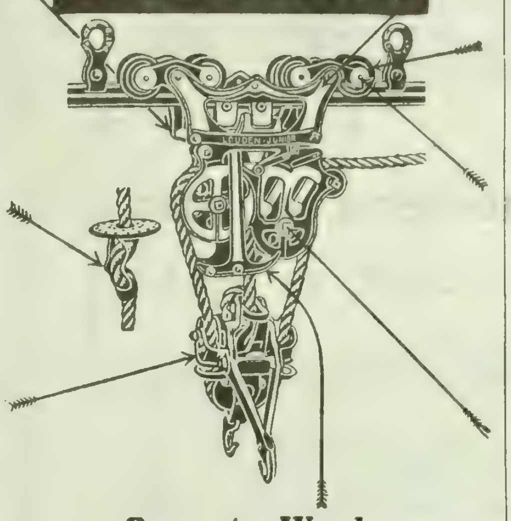
Raymond, A. E.. .. ..55, 151
Raymond, L. C.. .. .. ..30, 98, 213, 216, 231
Reid, W. J.. .. ..127, 157
Rutter, Mrs. E. B. 88, 183, 204, 223, 243

Sadler, W.. .. ..37, 38, 61
Savage, A.. 126
Simard, J. A.. 101
Sinclair, S. B.. .. .. 49, 93, 117, 141, 227
Seed Branch, Ottawa.. 252
Snell, J. F.. .. .. 33, 161, 194, 215
Stephen, W. F.. .. ..14, 81, 127
Summerby, R.. .. ..146, 230
"Sylvia".. .. ..110, 137

Vanderleck, J.. .. ..16, 72, 105, 128, 180, ... 214, 220, 234, 250

Walker, A. H.. .. ..28, 95, 168
Woll's "Productive Feeding of Farm Animals" 256

You save time and money on every crop you harvest — with the aid of a — LOUDEN Junior Sling Carrier



Patented Brace Block

A heavily ribbed malleable iron block attaches to the truck arms just below the track, and the bolt connecting the sides of the carrier frame passes through the lower end. This takes all strain off the bolt and increases the strength of the truck arms. No load can spread them.

Adjustable Trip

Used when desired to carry the load into the mow without elevating to the track. Slip it up or down on the centre draft rope as desired. A simple, effective adjustment without complicated parts. This trip is supplied when ordered without extra charge.

The Great Triple Purchase Feature

Three ropes lifting the load instead of two, as with the ordinary carrier; gives the horse one-half more power, reduces the strain on the ropes and lengthens the life of the outfit.

Engine Trucks

Distribute the load well along the track, increase the strength of the carrier and cause the load to run more steadily. No four-wheeled carrier, however much spread out, is so easy on the track or runs so steadily.

Short Truck Arms

The Truck Arms are only 5 inches long, nearly straight and extremely well braced. They cannot be sprung.

The Unbreakable Axle

These Axles are simply an extension of the main frame. Note how they are shouldered out at the frame; impossible to break them. No riveted or bolted pin axles are used on Louden Carriers. Such axles are always causing trouble.

Patent Bushings

The Pulley Sheaves run on Patent Bushings, recessed into the side of the frame. This takes all the strain off the bolt and puts it on the frame where it belongs. The sheaves are large, of extra strength and easy running.

Sure to Work

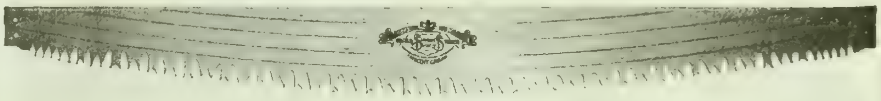
A trip stirrup extends below the carrier frame and attaches to the locking mechanism. It is impossible to keep the horse going on the draft rope and not bring the sling pulleys in contact with the trip stirrup. Once this is done the car is bound to leave the stop block and run back into the barn with the load. Side winds or uneven loads, cannot affect the proper working of the LOUDEN JUNIOR SLING CARRIERS.

Write for catalogue and special descriptive circular dealing with above Carrier.

LOUDEN MACHINERY CO., Dept. 34 GUELPH, Ont.

Hay Tools, Feed and Litter Carriers, Stable Equipment, Barn Door Hangers. (3)

Simonds Crescent Ground Cross-Cut Saws



This saw will cut 10 per cent. more timber, same time and labor being used, than any other brand of Cross-Cut Saw made. This guarantee has stood for thirty years.

There are two reasons for the superriority of the Simonds Saw—grinding and steel.

A saw that does not bind in the kerf cuts easy; a saw that binds is a bother. Crescent grinding insures saws ground so that the teeth are all of even thickness throughout the length of the saw, and the blade tapered for clearance to the greatest degree consistent with a strength of blade which enables the operator to push as well as pull the saw. Crescent grinding is an exclusive process, used only on Simonds Cross-Cut Saws.

Simonds Steel will take a temper to hold a cutting edge and stay sharp for a longer time than any saw not made of Simonds Steel.

There are two reasons why you should buy Simonds Crescent Ground Cross-Cut Saws—Quality and Price.

Superior quality makes your cutting as easy as cutting can be.

The price is moderate for the saw value given. It is about the same as you would pay for an inferior saw; therefore, why not get the best for your money—a saw with the manufacturer's name. "Simonds," on it. It is your guarantee and your protection. The saw illustrated—Simonds Crescent Ground Saw, No. 22—is the most satisfactory saw for all usual sawing purposes. Insist on your hardware dealer supplying you with Simonds Saws. Write to the factory for further particulars.

SIMONDS CANADA SAW COMPANY, Limited, Montreal, Que. VANCOUVER, B.C. ST. JOHN, N.B.

Always buy a saw with a sharp cutting edge—not a soft saw—because the former lasts longer and keeps its edge better.

FOUND MONEY

Subscribers wishing to take up subscriptions for the

JOURNAL OF AGRICULTURE

in their respective localities are requested to write to the manager for terms and conditions.

Use these modern slates; the ultimate cost is less!

Brantford Asphalt Slates offer you a permanent, attractive roof at a moderate price. Use them wherever wood, slate or tile shingles can be laid.

They can be put on quicker and cheaper than any shingle made. In three fadeless colors, red, green and black, each coated with crushed rock, embedded in the slate under pressure.

Brantford
Asphalt Slates

are pliable—will conform to curves and angles, need no painting, withstand any climate, retain their good appearance indefinitely, are proof against fire, lightning, wet, frost, heat and rotting.

Why use wooden shingles that warp, curl, split, come loose, decay, need renewing and are a fire danger, when you can put on these handsome, modern slates at only a fraction more, and save on your fire insurance premiums?

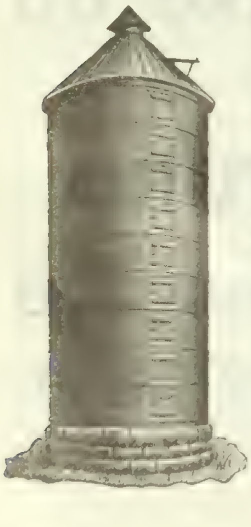
Booklet Free—Ask for a copy.

Brantford Roofing Co., Limited
Brantford, Canada

The only roll roofing plant in Canada controlled entirely by Canadian Capital.

82

"Montreal Office & Warehouse, 9 Place D'Youville".



The Green Silo

WHY IS IT
The Best Made
The Most Reliable
The Best Finish
The Best of all ?

Our catalog treating on the cultivation of corn from its seeding to ensilage will TELL YOU ALL ABOUT IT. Catalog sent free on request.

THE
PLESSISVILLE
FOUNDRY
PLESSISVILLE
Quebec, Can.

PURE bred rabbits for Sale—Big Giant Rabbits, weight from 12 to 15 lbs., gray steel fur; also Belgium Rabbits. ALB. FAUCHER, corner St. Bernard and Montmagny, Quebec.

98-N

Write it on the film — at the time.

Make every negative more valuable by permanently recording, at the time of exposure, the all important date and title. It's a simple and an almost instantaneous process with an

Autographic Kodak

Whatever is worth while in hand camera photography is found in the Kodak. So simple that the amateur can make good pictures from the very start, using dependable, non breakable Kodak films with which the camera loads in daylight. The camera themselves are accurate and reliable in every detail, the lenses are of the highest grade and the shutters work with a precision that is a mechanical delight. Kodak films may be developed without a dark-room or may be mailed to your finisher—the Kodak printing processes are simple in the extreme. Indeed Kodak has come to mean "photography with the bother left out" and it's less expensive than you think.

The latest Kodak feature is the Autographic idea. A little door in the back is opened and you write on the red paper of the Autographic Kodak cartridge any data that you like—the date or the title of the picture, or perhaps you photograph a friend and then he writes his name on the red paper. Or you can write down the details about the exposure for future guidance—the condition of light, the shutter speed and the stop opening used. In photographing the children you write down their age at the time the picture was made. In using the Kodak in a business way, there are always details of the utmost importance that can be jotted down which will add to the future value of the photographic record. When the date or title or whatever it may be that is written on the red paper, is exposed for a second or so to the sky the door is closed again and upon development such writing is found to be permanently imprinted on the film—occupying the intersecting space between negatives.

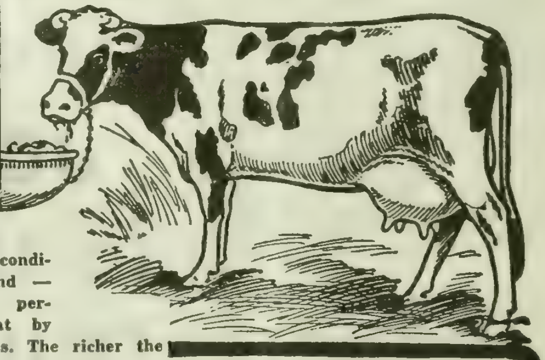
Whether photography interests you from the business side, or for the home and travel pictures or from the standpoint of the pure pleasure of picture taking —the camera becomes doubly useful, doubly fascinating if it has the Autographic feature. There's no extra charge for Autographic film and Autographic Kodaks are sold from $7.00 up.

Ask your dealer or write us for "Kodak on the Farm," a beautifully illustrated booklet that you will enjoy. There is no charge.

CANADIAN KODAK CO., Limited, 604 King St. W., Toronto.

FOR SALE—Bees and italian queens, up-to-date hives, honey-combs and all necessary supplies for bee-masters. J. O. LEVAC, Rigaud, Que.

WANTED—New Laid Eggs. Prompt cash returns at highest market price. Write for quotations. J. S. & A. B. LAPLANTE, 862 Lafontaine St., Montreal, Que.



This Feed Costs Nothing

If you count the results it gives.

Livingston's Oil Cake is just what cows need.

It tastes good—is easily digested — keeps stock in prime condition all the year round — actually increases the percentage of Butter Fat by 16% over Pasture Grass. The richer the cream, the more money you make. Livingston's is the feed that pays for itself. 10

Write for free sample and prices. Dominion Linseed Oil Co., Limited, 31 Mill Street Montreal.

Livingston's Dairy Oil Cake

JUL 7 - 1915

The JOURNAL of AGRICULTURE

AND HORTICULTURE

Volume 19 July 1st 1915 Number 1

A HAYING SCENE IN THE EASTERN TOWNSHIPS OF QUEBEC.

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

You are sure of satisfaction when you buy farm, dairy or creamery equipment sold by DeLaval

DE LAVAL
Cream Separators
SAVE IN 7 WAYS

QUANTITY of cream that other separators will not recover completely, particularly under the harder conditions of every day use.

QUALITY of cream as evidenced by De Laval butter always scoring highest in every important contest.

LABOR in every way over other systems, and also over other separators by turning easier, being simpler, easier to clean and requiring no adjustment.

TIME by hours over other systems, and as well over other separators by reason of greater capacity and the same reasons that save labor.

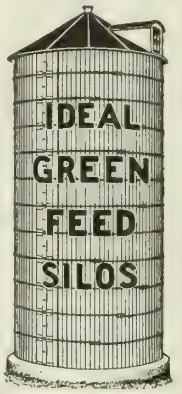
COST since while a De Laval cream separator may cost a little more than a poor one to begin with it will last from ten to twenty years, while other separators wear out and require to be replaced in from one to five years.

PROFIT in more and better cream, with less labor and effort, every time milk is put through the machine, twice a day, or 730 times a year for every year the separator lasts.

SATISFACTION which is no small consideration, and can only come from knowing you have the best separator, and being sure you are at all times accomplishing the best possible results.

These are all facts every De Laval local agent is glad of the opportunity to prove to any prospective buyer. If you don't know the nearest De Laval agency simply write the nearest main office, as below.

The advantages and savings made possible with an
IDEAL GREEN FEED SILO



MADE IN CANADA

The keeping of a larger herd.

The harvesting of the corn crop at less expense.

Storing the corn crop in less room.

Harvesting the crop in any weather.

Perfect and complete preservation of the crop.

Furnishing a perfect and uniform feed, maintaining the stock in better health.

An increase of at least 20 per cent. in the flow of milk and a decrease in cost of feeding of from 15 to 20 per cent.

Sale of hay without robbing the land.

This is about your last chance of getting a silo this year. If you want to feed silage next winter you must act quickly.

There is probably a De Laval agent in your town who will be glad to quote you prices, terms, etc. If not, an inquiry sent to the nearest De Laval office will receive prompt attention.

The largest line of Creamery, Cheese Factory & Milk Dealer Supplies sold in Canada.

12 Catalogues have just been issued covering these lines. Tell us what you need and we will send you Catalogue or Catalogues.

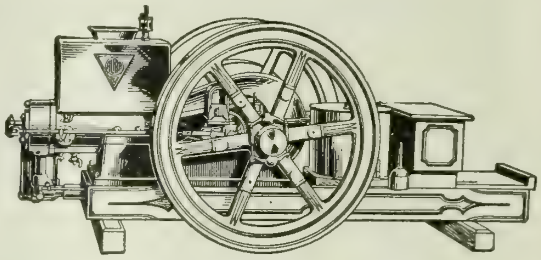
No tinkering worry or bother with an
ALPHA ENGINE

It plugs right along like a steady and well broken horse.

Anybody can run an Alpha Gas Engine. Your wife can run it; your boy can run it; the hired man can run it.

There is nothing mysterious or complicated about an Alpha. That's why it's an ideal engine for farm use.

Not only does the Alpha work well but it wears well, because it is made from the very best material and its workmanship and design are high-grade in every particular.



Largest manufacturers of Dairy Supplies in Canada. Complete catalogues of Cream Separators, Silos, Gas Engine, Dairy, Creamery, Cheese Factory, or Milk Dealer Supplies will be mailed upon request.

De Laval Dairy Supply Co., Ltd., Quebec, Montreal, Peterboro, Winnipeg

PLUGGING AWAY!

King George's NAVY PLUG

While the Allies march on to Victory, KING GEORGE'S NAVY PLUG CHEWING TOBACCO has won out on the Canadian Market.

TASTE THE LINGERING FLAVOR!

A blend of the choicest tobaccos, free from any 'sting' and famous for its fine aromatic qualities; appreciated by all amateurs. Try it---you have a treat in store!

MADE IN CANADA.

SOLD EVERYWHERE: 10c A PLUG.

ROCK CITY TOBACCO CO., Limited, Manufacturers, - - QUEBEC, CANADA.

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE

AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 97,962
ENGLISH, 9,820
FRENCH, 88,142

Volume 19
JULY 1st 1915
Number 1

EDITORIAL

SOIL FERTILITY

IN recent years our notions regarding soil fertility have had to be revised considerably. At one time it was believed that a chemical analysis of soil and plants would show us what fertilizers should be added to the soil. But practical experience tells us that the chemists's analysis must be qualified, and that the plant has several methods of securing food from the soil. The only sure way of finding out what the plant wants under any set of conditions is to try it with the plant.

It is not thirty years ago since we knew how legumes such as clovers, alfalfa, peas, vetches, etc. get their nitrogen from the air, and a great change has been effected in farming as a result. Legumes prepare nitrogen for non-legumes.

We are just beginning to realize that sulphur is needed by plants, and the use of land plaster or sulphate of lime is again being revived in some quarters.

Again, it has been demonstrated that plants grown for a series of years on the same land tend to poison the soil, an effect due probably to the breaking down of the roots. At any rate the poisoning of soils cannot be overlooked and the farmer is forced more than ever to rotate his crops.

Not very long ago it was believed that nitrates in solution were the only form of raw material a green plant could absorb from the soil, but lately it has been shown that corn, for example, can take in food in the form of ammonia, and some plants can make use of highly complex substances.

THE ORGANIZATION OF A RURAL COMMUNITY

THE great war raging in Europe is bringing home to every thoughtful person the importance of organization. If organization is of transcendant value in accomplishing great things, it should also be of value in the minor realm of agriculture of a province, county or township, yet it is often difficult to convince farmers that they need organization. "Team work" counts in agriculture as in other matters, providing it is wisely directed.

Dr. Carver, Economic Adviser of the Dept. of Agriculture, Washington, discusses this subject in the 1914 Year Book of the United States Department of Agriculture. His plan of organization is as follows: A community should be organized for *business needs* and for *social needs,* the whole under the charge of a central committee with five sub-committees in each division of the work. The sub-committees for business needs are: 1. Farm production; 2. Marketing facilities; 3. Securing farm supplies; 4. Finance and accounts; 5. Communication and transportation. The sub-committees for social needs are: 1. Education; 2. Sanitation; 3. Recreation; 4. Beautification; 5. Household economics.

It is impossible for us at this time to discuss the work of all these sub-committees, but we desire here to draw attention to the importance of neighnorhood organization or co-operation in the subdivision of *farm production.* Organization of business interests begins with production. Profitable marketing of farm produce depends nowadays upon proper *grading* and *standardising.* It is hardy practicable to sell goods on a large scale by the old method of inspection; consequently it is the first duty of a successful business community to make a uniform product such as the consumer demands, and to do this organization is required.

Again, organization is necessary for the breeder. It means that the whole community is interested in the same breed, and a wider basis of selection is secured which in turn makes possible more scientific mating than is possible where there are only a few breeding animals from which to select. Moreover, as Dr. Carver shows, it gives greater permanency and continuity than is possible where only a few individual farmers are interested.

Neighborhood organization for breeding gives opportunity also for the purchase of high class expensive animals which otherwise could not be secured.

We have dwelt on this point because we believe that in the keeping of several breeds in a single community breeders in this province, with a few exceptions, are making a big mistake. We all know what co-operative organization has done for the Ormstown district.

CUTWORM INJURY

MANY complaints are coming in with reference to the destructive work of cutworms in garden, root and corn crops. On account of their abundance and their climbing habits they are being called erroneously "army-worms".

A farmer near Montreal writes: "Fields of onions have been greatly damaged, and many farmers have plowed up the land. They have in some cases devasted an acre or more in two or three days. Parsnips, carrots and beets are being rapidly destroyed."

Another farmer near La Tuque writes: "I have had nearly half my peas, beans, corn and cucumbers eaten. I gathered half of a lard pailful (3 lb. pail) on three 20-foot rows of peas this morning."

In the last issue of the "Journal of Agriculture" we called attention to the best remedy for controlling cutworms, and one that has given entire satisfaction when properly applied—viz. the *poison bran-mash bait,* made by mixing 20 lbs. bran and 1 lb. paris green; squeezing the juice and gratings of three lemons or oranges into 3½ gals. of water; adding 2 quarts of molasses to this liquid, then wetting the poisoned bran and stirring thoroughly. The mash is scattered about in small handfuls among the plants to be protected, at dusk. We know of several cases where timely application (at the first indication of injury) saved the crops. The remedy is both simple and effective; it has been published time and again in all agricultural papers—yet the sorry part is that so many farmers have never seen the remedy, and are helpless to ward off the cutworm attacks.

The moral is clear—farmers should read some reputable agricultural newspaper, like the "Journal," and learn the latest methods of dealing with insect outbreaks.

THE WOMEN'S CLUBS OF QUEBEC

THE recent conference at Macdonald College of delegates from the newly organized Women's Clubs was a noteworthy event, on account not only of the large attendance but also of the many excellent papers and discussions on topics that come under the sphere of women's interests. The report of the Demonstrator, Miss Campbell, showed that the movement is spreading and that many important needful changes have been effected through the agency of the Women's Clubs.

It must be conceded that women have not had the same opportunities as men; they have been handicapped in the race of life, and they have not been permitted to exercise their proper influence in the community. Tradition dies hard, but a general awakening is in progress. We believe that the regeneration of country life will be brought about by the women rather than by the men. This regeneration will be a slow process, and will depend to a large extent on the time and strength the women have to engage in the vital affairs of the community. All this implies *proper preparation* for her sphere of work and a *readjustment of her home duties.*

By proper preparation is meant a thorough practical and theoretical training in all things pertaining to home-making in the wide sense of the term. This can be secured partly at home, but not entirely. It is customary to send boys to an agricultural college to train them for efficiency in country life, and to develop their outlook. It is equally necessary to have the girls trained in a school of Home Economics for efficiency and to develop their outlook on life. Give a woman a proper outlook by suitable education and she will revolutionise country life.

We are all trying to build up a rural life which will be satisfying and which will minister to our best and highest needs. This is the new Country Life movement. To attain this end our rural people must have a real anchor in their nature environment. It is as necessary for the woman as for the man to have an interest in the things which surround her on every side. Hence the need for a sympathetic knowledge of the beauties of Nature. Too frequently it is case of having eyes but seeing not and ears but hearing not the songs and voices of the common fields and woods. In other words, there is a pressing need for making our schools

CONTENTS

EDITORIAL. — Soil Fertility.—The Organization of a Rural Community.—Cutworm Injury.—The Women's Clubs of Quebec.—School Inspectors at Macdonald College.—Macdonald College Announcement.—Results of Year's Work in School of Agriculture.

ORCHARD AND GARDEN.—Some Abbotsford Orchards.—Root Maggots of Cabbage and Cauliflower.—July Notes in the Garden.—Cultivation in the orchard.—Introducing Queen Bees.

FARM AND FARM CROPS.—Alfalfa Experiments in Quebec.—Roots: Which is the best kind? Field Crops of Canada.—Clover Seed Production.—Rust in Water Pipes.—Feed the Soil; it feeds us.

LIVE STOCK.—Wool Grading in Quebec. — A Canadian Blue Cross Ambulance.—Agriculture in Stanstead County.—The Sixth Annual Show at Ormstown.—Young Men's Judging Competition.—Summer care of farm foals.—Exportation of wool.—Application and Care of farm Manure (cont.).—Sheep Raising.

DAIRY.—Champion Cows in each Breed.—The Amo Milking Machine.

POULTRY. — The Preserving of eggs in the home.—Separate chicks according to Size and Sex.—The Formation and Structure of the Egg.

WOMAN'S WORLD.—Foods and Food Preparation (cont.)—Second Annual Convention of the Quebec Homemakers' Club.—The Homemakers' Club and the Rural School.

GENERAL INTEREST.—Fishing for Smelt.—Kill the Weeds.—Eradication of Dandelions.—The Farmer's Income.—Dehorning Cattle.—Drying damp Cellars.—The Failure of Blossoms to set Fruit.—The Potato.—How to deal with Overproduction.—Life of Apple Trees.—Milk and its Care.—The Children's Homer.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

minister more than they do now to the needs of our rural communities. "What becomes a part of the school eventually becomes a part of the life of the people of the region."

Besides a suitable preparation for their life work, a readjustment of home duties is necessary before women can exercise their proper influence in the community. The position of the farmer's wife as the social head of the home and as the rearer of the children should entitle her to more freedom from manual labor that often saps her vitality. The life of many women on farms, it must be confessed, is too often one long dreary monotony of cares and worries, without that relaxation that comes to the city woman in mingling with her sex in social and other gatherings. Surely some of the many labour-saving devices and equipment can be installed in the home and save the women many long hours of work!

The health, the comfort and the happiness of the home are in her hand, but she must have the opportunity of acquiring right ideals if she is to exert her full influence in the home and in the community.

Under the influence of the women's Clubs, in a few years, we will find homes provided with modern sanitary conveniences, and other comforts, the boys and girls provided with wholesome, nutritious food for both body and mind; the cleanliness and neatness of the home extending to the stables so that clean wholesome milk is furnished to the table and creamery.

The schools will also be influenced; the women will demand well-ventilated, comfortable school buildings for the sake of their children, and school grounds made beautiful by flowers and trees; they will also demand teachers of experience and scholarship, and courses of study that relate the work of the school to the home life of the community.

We shall see woman's influence extending beyond the home and the school house—to her social surroundings. New interests will be aroused and her life will become less self-centred on account of the part she is taking in helping others to be useful and happy.

Sir Horace Plunkett has coined a catchy phrase to express the needs of agriculture — "Better business, better farming and better living." In this country life of campaign "the housekeeping faculty of woman" can be of great assistance in keeping better farm accounts and hence putting farming on a better business level. "In the development of higher farming, too, she is better fitted than the more muscular but less patient animal, man, to carry on with care that work of milk records, egg records etc., which underlies the selection of scientific lines of the more productive strains of cattle, poultry and grains.

It is, however, in the third division of the work—better living—that woman's greatest opportunity lies.

SCHOOL INSPECTORS AT MACDONALD COLLEGE

The Protestant School Inspectors of the Province of Quebec visit Macdonald College to take a short course in Nature Study and Elementary Agriculture

IN order to carry out efficiently the course of Nature Study and elementary agriculture the Protestant School Inspectors, who have to look after the effective teaching of this subject in the various schools in their inspectorates, took a short course at Macdonald College during the month of May.

The bulk of the work taken up directly concerned the work of nature study and elementary agriculture, but advantage was taken of their attendance at Macdonald College to give them some information on the work being carried on for the betterment of schools, and lectures on music, manual training and art work in rural schools were given by Messrs Stanton and Emberley, and Miss Doane. Professor Murray gave a lecture on "Seed Selection by Children"; Professor Barton on "How to interest children in farm animals"; Professor Lochhead on "The study of weeds and insects by children"; and Miss Fisher, head of the Household Science school, on "Sewing in Schools."

The course was thoroughly enjoyed by the Inspectors and the following resolution was passed at the final meeting:—

"RESOLVED that we desire to thank heartily the Principal and staff of Macdonald College for the very kind and courteous hospitality that we have received during this week, and we also wish to place on record our warm appreciation of the lectures, demonstrations and discussions of the week. These have been of the greatest practical value, and cannot fail to aid us effectually in our inspectoral and teacher conference work during the coming school year. We recognise the importance of bringing the work of Macdonald College, not only in relation to teacher training, but in its varied scientific, agricultural and cultural acti-

The Protestant School Inspectors of Quebec who recently spent a week at Macdonald College.
Back row:—Rev. J. H. Hunter, M. A., Coaticook; J. W. McOuat, B.A., Lachute; O. F. McCutcheon, B.A., Leeds Village; Dr. D. W. Hamilton, Macdonald College.
Front row:—J. C. Sutherland, B.A., Inspector-General; Rev. E. M. Taylor, M.A., Knowlton; Rev. H. A. Honeyman, M.A., Hull; Rev. I.N. Kerr, M.A., N. Hatley; Rev. W. O. Rothney, B.A., Richmond; Rev. J. M. Sutherland, M.A., New Carlisle; A.L. Gilman, M.A., Cowansville.

vities, into the closest possible touch with the work of the schools, and we are confident that the fact of holding the annnual Inspection Conference at this institution will assist substantially to that end."

MACDONALD COLLEGE ANNOUNCEMENT

WE have just received an advance copy of Macdonald College Announcement of 1915-1916, which is illustrated with photographs of students at work in the several schools. It sets forth the assistance offered by the College to the farming community of the Province of Quebec. This assistance includes, in addition to the free winter short courses, free tuition to the sons and daughters of farmers of the Province of Quebec:—

(a) In the School of Agriculture, in the first and second year classes, where other residents of Canada pay $50, and non-residents of Canada $100, per session. The Provincial Government grants $7 per month of attendance to students in the School of Agriculture belonging to the Province of Quebec employed in studying according to the time tables.

(b) In the School for Teachers—where other residents of Canada pay $75. and non-residents of Canada $100. per session. In this school, all students of the Province of Quebec benefit by the free tuition privileges. Bursaries also are allowed, under certain conditions, to all students of the Province of Quebec; likewise travelling expenses.

(c) In the School of Household Science—where, for one and two-year courses, other residents of Canada pay $75. and non-residents of Canada $100. per session—and, for the short courses, all other students pay $25. for the course. The Provincial Government also grants fifty bursaries of $20. each to Province of Quebec students taking courses of one or two years.

In connection with all of these regular courses, board and lodging is provided at the rate of $4. per week, single rooms $4.50.

Visitors to the college from the farming community of Quebec are always welcome, from 9 a.m. until 5 p.m., excepting on Sundays, Saturday afternoons and public holidays.

Upon request, and when convenient arrangements can be made, judges, speakers and educational exhibits are supplied from the three schools of the College, and especially from the scientific and practical departments—to agricultural societies, etc.

The various departments of the college offer their services for the advancement of the agricultural and home interests of the Province of Quebec. In the School of Agriculture, such services are available from the agricultural engineering, the animal husbandry, the bacteriology, the biology, the cereal husbandry, the chemistry, the home dairying, the horticultural, the physics and the poultry departments. The School for Teachers is willing to act as a bureau for the supply of trained teachers for service in the province. The School of Household Science will answer questions relating to household subjects.

Excursions organized by agricultural societies, farmers' clubs, etc., are invited to the College during the month of June to inspect the work in progress in the various departments.

In cooperation with the Provincial Department of Agriculture, the college will send, during the summer months, a drainage adviser to any farm in the Province of Quebec. The adviser will make a drainage survey of the farm, and prepare a plan of the drainage system suited to it, showing the location and grade of the drains, the number and size of tile, etc. The adviser will show the farmer how to dig his drain true to grade, how to lay the tile, make joints, etc. There is no charge for the service of the adviser, but the farmer for whom the survey is made is required to pay the adviser's travelling expenses, consisting of, for the round trip, the lowest regular one-way first-class railway fare ond one-third, meals on the way, if any, and cartage of instruments, if any. The farmer must meet the adviser at the station and return him to it, board him while at work, and furnish him with the assistance necessary for the work.

Macdonald College Demonstrators. - These have been increased in number during the year to eight and are now located at Shawville, Cowansville, Cookshire, Lennoxville, Huntingdon, Richmond, Ayer's Cliff, Lachute. These demonstrators are the technical demonstrators of Macdonald College resident in certain of the farming centres of the Province of Quebec. Their assistance is offered to the farming communities concerned in the organization of farmers' clubs, co-operative societies, egg circles, meetings, exhibitions, picnics, etc.; in addressing meetings, in conducting experiments and demonstrations with fertilizers, in alfalfa growing, spraying of orchards, vegetables and weed pests; in aiding the introduction of seed corn and registered seed; in conducting milk tests, in officiating at stock judging contests, ploughing matches, etc., in making drainage surveys, etc., in preparing plans for stables, hog pens, poultry houses and silo construction; in answering local enquiries; in giving advice to farmers on their farms, on soils, seeds, stock, drainage, buildings, etc.; in giving agricultural instruction in the academies; in the forming of children's poultry, corn and potato clubs, and in arranging for school fairs in connection therewith. Farmers are requested to communicate their enquiries to the nearest demonstrator.

The services of the Macdonald College Demonstrator to Homemakers' Clubs of Quebec are offered to the women of the farming communities of the Province of Quebec, to assist in organizing homemakers' clubs and co-operative societies in their various localities, in planning and arranging for meetings, and in giving lectures and demonstrations on the homemaker's problems. A circulating library has been started at the College consisting of bulletins, pamphlets, and magazine clippings, which may be used in preparing programmes for club meetings. Any club member may have the literature requested on condition that it is not removed from the folder in which it is sent out, and that it is returned in the same envelope within two weeks. Papers will not be prepared, but questions will be answered and information sent to those preparing papers, upon application. The women of rural communities are urged to take advantage of this offer of the demonstrator's services and to do their utmost to extend the work of the homemaker's clubs—by their organization in their own localities and by sending the demonstrator the names and addresses of women of other districts who would be interested in promoting such work.

Publications. Macdonald College issues occasional bulletins to children who are members of poultry, corn and potato clubs. These are distributed through the Macdonald College Demonstrators. Bulletins on "Farm Poultry", "The Milk Supply of Montreal", and "The Farmers' Vegetable Garden" are available for distribution. The editing of the Journal of Agriculture and Horticulture (English edition), published monthly by the Department of Agriculture of the Province of Quebec, Quebec, P.Q., is undertaken by members of the staff of Macdonald College.

We notice that there are now seventy members of the instruction and administration staff. The college announcement is certainly a most interesting document to all concerned in education and rural progress in the Province of Quebec and eastern Canada generally. Copies may be had free of charge upon application to the Registrar, Macdonald College, P.Q.

MACDONALD COLLEGE

Results of Year's Work in School of Agriculture

(Fourth year list of graduates was given in last issue).

Third year

THE following students have completed the Third Year work and are entitled to enter the Fourth Year (Names in order of merit.)

General Proficiency:—

CLASS I.

Schafheitlin, R. Canning, N. S.

CLASS II.

Gooderham, C. B., Round Hill, N.S.,
Fraser, J. G. C., 10 Laval St., Quebec, Que.
Boving, G. B., Macdonald College, P. Q.
xMcOuat, J. H., Lachute, Que.
Hacker, J. M., North Bedeque, P. E. I.

CLASS III.

xHutchings, C. B., Ste Anne de Bellevue, Que.
Sutton, W. E., Barnston, Que.
Crothers, L. W. F., Ste Anne de Bellevue, Q.
xHyndman, A. E., 45 Montreal St., Sherbrooke, Que.
xMoynan, J. C., Waterloo, Que.
xHay, G. C., Lachute, Que.
xxBiggar, T. H., Huntingdon, Que.
Ste Marie, J. A., R.D. No. 2, Compton, Que.

(Ungraded—2nd term only):

Fenoulhet, Geo., Macdonald College, Que.

Aegrotat standing:

xCochrane, E. S., Clarenceville, Que.
xLyster, C. E., Kirkdale, Que.

The following students enlisted for the European war towards the close of the third year and were granted pass standing:—

Boulden, C. E., Windsor, N. S.
Collingwood, G. F., Dartmouth, N. S.
Kelsall, A., Wilmot, N. S.
McMahon, E. A., Aylesford, N. S.
Peterson, C. F., Great Barrington, Mass.

("x" indicates supplemental examination required in one subject).

Second year

The following students have completed their second year and are entitled to the diploma given by Macdonald College for the two-year course in Agriculture.

General Proficiency:—

CLASS I.

Hodgins, S. R. N., Shawville, Que.

CLASS II.

Broad, Miss Katie, Central Cambridge, N. B.
Hetherington, T. G., Cody's Station, N. B.
Newton, J. D., Plaisance, Que.
Wood, E. G., R.R. No. 1, Lachute, Que.
xFiske, R. C. M., Florenceville, N. B.
Longworth, F. J., 49 Lonsworth Ave., Charlottetown, P. E. I.

CLASS III.

Ross, P. D., Lancaster, Ont.
Skinner, S. G., Macdonald College, P. Q.
xHodgins, W. E. K., Shawville, Que.
xxRankin, T. F. G., Macdonald College, P. Q.
xMorris, C., Ste Therese de Blainville, Que.
Dunsmore, W. G., Huntingdon, Que.
Roy, L. C., Sabrevois, Que.
xBothwell, A. F., L'Avenir, Que.
xxElliott, R. M., Danville, Que.
xxMuir, E. B., Howick, Que.
xxHay, W. D., Lachute, Que.
xRough, D. H., Knowlton, Que.
xxDickson, G. H., Rectory Hill, Que.
Hand, J. S., Greenwich, N. Y.
xxReid, W. J., Chateauguay Basin, Que.
xxGruer, D., Aubrey, Que.

Aegrotat:

xGillespie, J. M., Abbotsford, Que.

THE GARDEN AND ORCHARD

SOME ABBOTSFORD ORCHARDS

A recent visit was made in company with Prof. Lochhead to Abbotsford and Rougemont while the apple orchards were in full bloom and many of the orchards were visited. The demonstration orchards at both these places were in fine shape and give promise of a fair crop of fruit this year, following a heavy crop last year. McIntosh and Fameuse trees particularly seemed to be full of bloom. A marked difference could easily be seen between the well cared for orchards and those more or less neglected. The more progressive growers realize that their orchards mean big money to them providing they get a good crop of good fruit, and knowing this, they set about making their trees bear these good crops of good fruit.

Two orchards at Abbotsford are specially worthy of mention, those of Mr. Chas. Byers and Mr. C. E. Slack.

The chief fruit inspector for Ontario, Mr. J. P. Carey who visited Mr. Byer's orchard last year, said this orchard had the finest crop of Fameuse in it that he had ever seen, and Mr. Carey has seen most of the good orchards in Ontario. This orchard has been well taken care of in the past and gives promise of a fair crop of fruit this year although the crop will not be nearly as heavy as last year.

Blossoming time in Mr. C. E. Slack's Orchard, Abbotsford. The 17 trees on left produced 50 barrels of McIntosh apples, in 1914. Note the amount of bloom this spring. Mr. Slack on the right and J. Crossfield on the left.

Mr. Slack is going into orcharding quite extensively. Some few years ago he set about improving an orchard that had been previously neglected as far as cultivation and spraying was concerned, and what he has since accomplished in this orchard is a splendid demonstration to anyone interested in apple orcharding of the results of up-to-date methods of cultivation and spraying. We could not find a serious insect pest of any kind in the main part of his orchard, so thoroughly was the spraying done. The first two sprays had already been given and the third would be given as soon as the blossoms had fallen. The illustration accompaning this article shows a view of part of this orchard. The row of trees on the left, McIntosh, seventeen in number, produced fifty barrels of choice apples last fall, and judging from present prospects another fifty should be produced this year. The average for the province is slightly over 1 bushel per bearing tree per year. Mr. Slack's seventeen trees averaged over eight bushels last year.

Part of the orchard is yet in sod and here the trees are not nearly so healthy or vigorous, and what is more to the point they have little fruit on them in spite of the fact that their crop last year was not heavy.

An up-to-date power sprayer is used in this orchard and Mr. Slack manufacturers his own lime sulphur solution as he finds it much more satisfactory and cheaper.

Some fertilizer experiments have been carried out but cultivation has shown quicker and more pronounced results. Cultivation is given as early in the spring as it is possible to get on the land and no attempt is made to get close to the trunk of the trees. Cultivation is then continued until late June when a cover crop is sown; this consists of rape, buckwheat, clover or vetch. Clover and vetch are more expensive in cost of seed than the first two but are somewhat better in an orchard.

Both Mr. Byers and Mr. Slack deserve great credit for having orchards in such splendid shape, and it is regretted that there are not more orchards like them.

T. G. BUNTING

---

xHatch, E. C., Oromocto, N. B.

The following students enlisted for the European war towards the end of the second year and were granted standing:—

Bailey, H. C., Barbados, B. W. I.
Bradford, W. C. R., R.R. No. 5, Lachute, Que.
Jones, A.R., 80 Somerville Ave., Westmount, Que.
Milne, A. R., Pointe Claire, Que.
Spendlove, J. R., Ayer's Cliff, Que.
Viane, E., 30 Knightsbridge, London, England.

First year

The following students have completed the first year work and are eligible to enter the 2nd year:—
General Proficiency: (Names in order of merit.)

CLASS I.

Newton, Miss Margaret, Plaisance, Que.
Birks, H. M., 715 Pine Ave., Montreal, Que.

CLASS II.

Bennett, C. R., Bury, Que.
Cameron, S. Y., Adamsville, Que.
Tilden, S. F., 67 Rosemount Ave., Westmount, Que.
Hodge, R. C., Cookshire, Que.
Jones, W. N., 80 Somerville Ave., Westmount, Que.
Matthews, G. D., Macdonald College, P. Q.
Atto, R. T., Lennoxville, Que.
Hawke, L. C., Ste Anne de Bellevue, Que.
Frank, W. D., Kingsbury, Que.

CLASS III.

xMacBean, R. E., Danville, Que.
Mace, H. S., 378 Main St., Rutland, Vt.
Cairnie, G. C., Coaticook, Que.
Macfarlane, I. P., Huntingdon, Que.
xSmiley, V., R.R. No. 2, Shawville, Que.
xxStandish, C. G., Rougemont, Que.
xChauvin, F. D., 720 Maplewood Av., Montreal, Que.
xDodd, J. J., Beech Ridge, Que.
Robinson, F., Duclos P. O., Que.
Holden, E. W., St. Armand Centre, Que.
Holmes, W. B., R.M.D. No. 1, Ayer's Cliff, Que.
xxWoodwark, W. W., St. Eustache, Que.
Loomis, C. B., Lennoxville, Que.
Buckland, A. J., Coaticook, Que.
xTodd, R. H. D., R.M.R. No. 2, Lachute, Que.
Norcross, A. C., Lennoxville, Que.
Reid, R. J. M., Chateauguay Basin, Que.
Derick, R. A., Clarenceville, Que.
xxDrouin, J. E., Park Laval, Laval County, Que.
xxAird, D. M., 317 Elm Ave., Westmount, Que.
xWalsh, C. E., Shawville, Que.
xxCarleton, H., 16 Baird Street, Ottawa, Ont.
xxCorrigan, W.V.L., Shawville, Que.

Aegrotat:

Arnold, G. E., Grenville, Que.

("x" indicates supplemental examination required in one subject.)

The following students enlisted for the European war towards the end of the first year and were granted standing:—

Ashby, P. T. H., Ste Anne de Bellevue, Que.
Brighton, H. W., 12325 Jasper Ave., Edmonton, Alta.
Buckland, W. B., Way's Mills, Que.
Flood, R. R., St. Armand Centre, Que.
Lefebvre, J. G., 101 Hutchison St., Montreal. Que.
Paterson, W. J., 72 York St., Westmount, Que.
Richardson, J. J. G., Chateauguay Basin, Que.
Roy, J. S., Bedford, N. S.
Walsh, G. B., Shawville, Que.
Wilson, C. A., Waterville, Que.

ROOT MAGGOTS OF CABBAGE AND CAULIFLOWER

Editor, Journal of Agriculture.—

I have a small kitchen garden at C.... on the river bank. It is troubled with small white maggots (or perhaps cut worms) which attack the roots of my cauliflowers and cabbages, and bore into them. What should I do? This is my first year of gardening, so soil is new.

G. H., Montreal

Ans: The usual method of control is by way of prevention rather than cure. Since the maggot works under ground it is practically impossible to deal with it after it has once made its appearance.

The usual method with cabbages is to place a collar of tarred felt about each plant when it is set out, the collar lying on the surface of the ground and made by means of a metal punch. This prevents the fly from laying her eggs about the crown of the root and is highly recommended where it has been used, the only objection to it being the trouble involved in making the collars, but this may be overcome by doing the work in spare time in the winter and having a supply ready for spring transplanting.

The home of Chas. Slack, Abbotsford.

Another method, and one that is widely used by the truck gardeners about New York, is to protect the seed bed of the plants after replanting with cheese cloth to prevent the laying of the eggs. The third method which may be used to advantage in late planting is to make applications of carbolic acid emulsion made by dissolving 1 lb. soap and 1 gallon boiling water into which 1 pt. carbolic acid is poured, and the whole mass agitated into an emulsion. This is put into a jar and can be kept for use until required. When wanted for use 40 gallons of water, 2 pts. of the emulsion and 1 lb. arsenate of lead are mixed together. This will suffice for 1,000 plants. For a small patch of cabbages 1-3rd. cupful is poured around each plant as it is set out. Where the cabbages are grown in large numbers it would be advisable to use a line of hose attached to a spray pump barrel and to go down the rows, adding the solution to each plant by means of the hose.

Cabbage and cauliflower root maggots are among the most difficult insects of the garden to control. The eggs are laid by the adult fly on the stem on or below the surface of the soil and the maggot hatched bores into the roots. A second brood appears in July but these rarely harm the cabbages which by this time are well started.

W. L.

JULY NOTES IN THE GARDEN

BY July 1st all cutting in the asparagus bed should cease. Remove all weeds by a thorough cultivation, and dress heavily with well-rotted manure, adding nitrate of soda at the rate of 100 lbs. per acre. From now until fall the plants store up the food which will go to the production of next year's crop so they must have plenty of available food for their growth requirements. As the top develops it should be kept well sprayed with Bordeaux Mixture (4-4-40 formula) to which has been added 1 lb. Paris Green or 2 lbs. Arsenate of Lead. This will control the Rust and Asparagus Beetle.

Cabbage and Cauliflower for the late crop are planted at this time. Be sure that the plants are well set. If it is dry, water should be applied to each plant. In small gardens one can carry the plants in a pail in which is a batter made of clay, cow manure and water. This gives the plants moisture and food, at the same time causing the ground to adhere to the roots. Set the plants well down into the soil and keep the cultivator going to preserve moisture. If the cut worm is troublesome use the poisoned Bran mash made up, 50 lbs. Bran, 1 lb. Paris Green, 1 qt. Molasses, juice of three lemons and water enough to moisten. Put it around the plants or between the rows. Keep animals and poultry away. The little white cabbage maggot which destroy the cabbage stem just below the ground is plentiful just now. In the small garden one can draw away the earth from the plants and destroy them or use corrosive sublimate, 4 oz. to 5 gals water, using 1 teacup full to each plant.

Celery should be kept well sprayed with Bordeaux Mixture, so that all new leaf surface is covered. Never work in celery while the leaves are damp as it tends to spread the disease. In small gardens celery may be planted in trenches 6-12 inches deep. This gives a longer stem and makes blanching easier.

Keep all seed stalks off the rhubarb plants as the production of seed will weaken the plant growth.

Bordeaux Mixture:—

Copper sulphate (bluestone), 4 lbs.; fresh lime, 4 lbs.; water, 40 gallons. Dissolve the copper sulphate in a wooden or brass vessel with hot water. Pour into a barrel and add enough cold water to make 20 gallons. Slake the lime in a barrel in a small quantity of water (hot water is best), and make up to 20 gallons. Then pour the copper sulphate solution into the lime solution and use at once.

A. H. MACLENNAN,
Macdonald College

CULTIVATION IN THE ORCHARD

THERE may be a few special cases where the crops from an uncultivated orchard compare favorably with those from an orchard which has been cultivated, but it may be put down as a safe rule that an apple orchard needs cultivation to make it a commercial success. Cultivation should be begun before the trees are set out—thorough preparation on well drained land. Plow shallow early in spring and cultivate often until latter part of June. Then sow what is known as a cover crop along the tree rows extending a few feet on each side of the trees, increasing width each year until it is six or seven feet on each side of tree when trees are about eight years old. In this way moisture is conserved in the early part of season and conditions are made favorable for the development of the root system and good healthy growth of foliage. The cover crop around the trees makes harvesting easier and lessens the amount of injury to any fruit that may fall. The most important effect, however, is that the tree ripens its wood earlier and is in a better condition to stand the winter.

Crimson clover and red clover make good cover crops as they add nitrogen to the soil and form a nice mat. Field peas and beans are also in this class but do not make as good a mat, growing too high. Crimson clover lasts only one season and is easily plowed under in the spring. Vetch also may be used with good results. Rape makes a heavy succulent growth and seed is cheap, but it remains wet for a long time after a rain. Buckwheat is a good crop to smother out weeds. Wheat, Barley and Oats are less desirable except when a greater quantity of moisture needs to be taken from the orchard.

Rate of Sowing per acre:—

Crimson Clover	20	lbs.
Red Clover	16	"
Vetch	1½	bu.
Canada Field Peas	1½	"
Soy Beans	1½	"
Turnips	2	lbs.
Rape	4	"
Barley	1½	bu.
Oats	2½	"
Rye	1½	"
Buckwheat	1	"

Do not grow hay in the orchard.

Intercropping

Utilize the land between the rows not taken up with the cover crop by growing early crops such as cabbage, carrots, beets, potatoes, etc. Strawberries may be grown if kept clean and not left more than two or three seasons. The bush fruits, raspberries, currants, etc., are less desirable for the orchard.

In all first class orchards, when the trees come into full bearing, the owners cease to intercrop and practice clean cultivation on the whole area between the rows.

A. C. GORHAM

INTRODUCING QUEEN BEES

ONE of the most delicate operations in the apiary is introducing laying queens into a new hive. At certain seasons of the year it is almost impossible to do so, especially when the bees have been robbing and there is no honey coming in.

Before introducing a new queen to a hive it is necessary to remove the old queen in the hive or to make certain that there are no virgins in it. All queen cells should be removed also. It is a pretty easy matter to remove Italian queens because their light yellow color shows up plainly among the other bees on the combs. In the case of black queens it is more difficult owing to their dark color which harmonizes with the other bees and because black bees are inclined to be more restless and run about over the combs. A good way to catch black queens is to take an ordinary hive body with a tight cover and screen the bottom with perforated metal queen excluder. Then shake the bees off the combs into this hive body and also shake the bees remaining on the bottom board and hive. Put on the hive cover and send a few puffs of smoke up through the queen excluder to excite the bees and get them to come out through the perforated metal. In ten or fifteen minutes most of the bees will have passed through the metal and escaped. Then remove the cover and the queen will be found with the small cluster of bees and drones which remain.

The best way to introduce a queen is to remove the old queen and then four or five hours later open the hive and simply lay the queen cage in which the queen is received through the mail, on top of the frames wire cloth side down. Then do not disturb the hive for about a week. If the colony is disturbed within a shorter time the probabilities are that the bees will ball the queen and kill her. Queens purchased from a queen breeder are always sent out with directions for introducing

THE FARM AND FARM CROPS

ALFALFA EXPERIMENTS IN QUEBEC

FOR a province so extensively devoted to dairying as is Quebec, no crop has greater possibilities than alfalfa. It is preemiently adapted to the production of milk and is relished by cattle as is no other crop. Fed in conjunction with fodder corn, they combine to form almost a balanced ration, and when utilized in this way alfalfa can take the place of part of the grain ration. As a soiling crop it will produce a greater weight per acre than corn, and is, moreover, a feed that has more nutritive value per ton.

Many farmers believe that alfalfa would be a valuable crop for them but they cannot fully appreciate its value until they have grown and fed it. The difficulty up to the present in Quebec has been to get it to grow and to produce paying crops. Many attempts at growing it have resulted in failure and in consequence the experimenters have lost faith in the crop. A few failures in a district usually discourages further attempts to grow it.

It has been conclusively proven that one reason for many failures has been the sowing of seed of tender varieties. Experiments at Macdonald College have demonstrated that while ordinary commercial varieties will survive mild winters in this climate only the most hardy varieties will survive a severe climate. It is money wasted to buy seed of any but the hardiest varieties even though the price of the latter be much higher.

The trials made in several parts of the province during the past three years by the Conservation Commission, which have been under the supervision of the Cereal Husbandry Department of Macdonald College, have demonstrated several other points. One of the most vital of these is that lime should be applied to the land before the alfalfa seed is sown. It is well known that alfalfa will not thrive unless the soil conditions are such as favor the development of the bacteria that live in the nodules on the roots of the alfalfa plant. These bacteria will not live in an acid soil and the application of lime or ground limestone is necessary to correct the acid conditions. It would appear that most of the Quebec soils are acid and on such soils it is absolutely essential that lime be applied before alfalfa will thrive.

Another essential frequently overlooked in sowing alfalfa is that the soil be free from grass and perennial weeds. Alfalfa makes a comparatively weak growth the first year and if it has to compete with grass the stand is sure to be disappointing.

The Conservation Commission has discontinued the work with alfalfa, but it has been taken up by the Cereal Husbandry Department and with the aid of the Demonstrators considerably extended, twenty six new plots being seeded this year. A number of plots have been sown broadcast with a nurse crop of barley, and a number have been sown broadcast without a nurse crop of any kind. In dry seasons particularly, a nurse crop is of doubtful advantage as it robs the young alfalfa plants of the moisture required to make them strong and vigorous to go through the first winter. Several plots have also been sown in rows thirty inches apart, using about four pounds of seed per acre. The primary object in sowing in rows is to produce seed, but we hope also to demonstrate that grass and weeds can be better controlled when an opportunity is given to cultivate the crop.

In all the experiments a good quality of Canadian grown Grimm seed was used so that any failure on account of the seed is very improbable.

JAMES MURRAY,

Macdonald College

ROOTS

WHICH IS THE BEST KIND?

AT meetings and private discussions the above question—which is the best kind of roots—is very often brought up. One man will claim that a certain variety of mangels is far superior to any other kind of roots while another is just as certain that such and such a swede will outyield anything else. One does not, as a rule, find many advocates for turnips or carrots, although these two kinds undoubtedly have their place on certain soils and for special purposes.

Who is right then—the champion of the mangels, the advocate of the swedes or he who peradventure recommends turnips or carrots? This question is a rather ticklish one to answer because each man probably is the propounder of the truth, that is to say for his locality and his average conditions. There is no such thing as the best breed of horses, neither can it be claimed for any particular breed of other kinds of livestock that it is preeminently adapted to all conditions. The same argument holds in regard to different kinds of roots.

It was stated above that turnips and carrots are invaluable under certain conditions. And the fact should not be overlooked that turnips, on account of their rapid growth, present a high yield of succulent feed as early as the month of August. At this season of the year the pasture is generally short, the ordinary soiling crops are mostly too ripe, and the corn is still a little too green to be used to advantage. The carrot crop will very often present the feed unit at a lower cost than other roots on rich, light soils and in warm summers. For this purpose the carrots must, however, be properly grown, i.e. the harrow or the rake must be used for the purpose of thinning instead of the hoe.

Mangels or Swedes

But aside from these special conditions the main interest of the root growing farmer will naturally centre around mangels and swedes. While it must be admitted that mangels, on good land and in favourable seasons, outyield swedes in many parts of our province, it should be borne in mind that these two ideal conditions, good soil and favourable seasons, do not present themselves eveywhere or every year. And just here I should like to emphasize the fact that mangels require a deep, rich soil in good heart. They cannot, as a rule, compete with swedes or turnips on weak land, even if this has had a heavy dressing of farmyard manure with a liberal supplement of commercial fertilizers.

Mangels give too small a yield after cold and rainy summers, while swedes are not unfavorably influenced by a cool or wet season. Again, a warm and dry period very often sets back the swedes through subsequent attacks from aphis and mildew. On the other hand, if the heat and drought are not too excessive mangels suffer comparatively little, at least on deep soils. We see, therefore, that these two kinds of roots complement each other in more than one way, and under ordinary circumstances, it is always advisable to grow both mangels and swedes. On a good mangel farm I would thus plant one third to one fourth of the root area with swedes, and if my land were not in such a high state of culture as to produce mangels to perfection I would make swedes my main crop, but would still reserve a piece of my root land for mangels. This arrangement tends to equalize to some extent the influence of seasonal differences on the total root crop.

Best Varieties and Strains

The choice of the proper variety of either mangels or swedes is of little less importance than the selection of the right kind. Among the mangel

---

which should be closely followed. Another way of introducing queens, which is almost uniformly successful when employed in small colonies or nuclei, is known as the smoke method. To introduce with smoke spread the frames apart somewhat, an inch or so is enough, replace the cover and open the entrance wide. Put some good live coals in your smoker and then fill it up with some strong variety of leaf tobacco; work the smoker vigorously for a moment or so until thick white clouds of smoke are rolling out. Then blow the smoke into the entrance of the hive for about a minute, close the entrance for a short interval and when you open it notice if some of the bees roll down the entrance as if stupefied; if so, they have been smoked enough. Treat the queen and the bees in the cage with her in the same way, being careful not to get the nozzle of the smoker so close to the cage as to burn the bees with hot smoke. Then remove the cover of the hive, tear off the wire cloth screen on the queen cage and drop the queen and bees with her in among the other bees in the hive; replace cover and the operation is completed. This is a good way to introduce quickly to small swarms or nuclei but should not be attempted when the colony is strong in bees as it is a rather difficult matter to make the smoke penetrate thoroughly to all parts of the hive.

Introducing virgin queens direct from their cells is a very easy matter. Any time after five or six days from the time that the first or prime swarm issues, if the hive from which they come is opened, a dozen or more queen cells will be found, some of these will be ripe, i.e. if they are held up towards the sun or some strong light one will see the young queens moving about inside their wax walls. In a great many cases they will be found gnawing off the capping of their cells, preparing to come out. Now if there are some colonies that are queenless, cut out these ripe cells from the comb and take them to the queenless swarm and lay one on top of the frames. The queen will emerge and after about ten days, if the weather is good will be found to be laying. If this plan is employed with a swarm from which the queen has been removed it is best to allow a day or two to elapse between the time when you remove the old queen and introduce a virgin in a ripe cell. Virgins may also be introduced and mated after they have hatched from their cell by the smoke plan if not more than two or three days have gone by between time of hatching and introducing into another hive.

The vigor of a queen largely determines the prosperity of a hive. If the queen is old or is an inferior layer the colony will not build up rapidly nor will it gather a maximum crop of honey. With a young strong queen a small swarm will go ahead and build up quickly. The whole success of the colony is largely dependant on the queen, therefore don't keep old queens in your hives. A queen that has gone through three summers is very nearly at the end of her powers and should be changed for a young queen. An old queen tends to slacken up at the end of the summer; consequently when winter sets in there is only a small force of young bees to go through the cold weather with, and the swarm is weak in the following spring.

A young queen will continue laying quite late in the fall and will have a large number of young bees to maintain the colony during the winter and early in the following spring.

HARRY W. JONES,

Bedford, Que.

BANGHOLM—OLSGAARD.—A "Bangholm" strain of Danish breeding that has outyielded other swede varieties except those originated at Macdonald College.

varieties at present offered on the Canadian market we find the best in the intermediate class. Of these the "Danish Sludstrup" and the "Yellow Intermediate" from Wm. Ewing & Co. Montreal, stand at the top. Available swede seed is generally more reliable than the mangel seed, and several good varieties may be obtained. Broadly speaking, the globe shaped swede types seem to be better bred than the tankard shaped. In other words—such varieties as "Magnum Bonum", "Hall's Westbury", "Canadian Gem" and "Bangholm", will likely outyield the common quality of "Elephant", "Kangaroo" and other tankard swedes.

Certain foreign grown varieties of Swedish and Danish origin have, among others, been tested at Macdonald College for a number of years and have outyielded the ordinary market varieties. The Danes have produced some excellent strains of the "Bangholm" swede. "Bangholm-Olsgaard" and "Bangholm-Pajbjerg III" have outclassed all other swede varieties and strains except those produced at the College. The two leading mangel varieties "Barres Yellow-Red" and "Barres Cylinder", which top the list for seed grown outside of the College, are both of Swedish origin.

Our experience at Macdonald College, corroborated by experiments in other parts of the Dominion, is, however, that home grown seed from carefully selected roots is of better quality and gives higher returns than any other seed. This seems quite natural simply from the standpoint of acclimatization. Good individual mother plants developed under Canadian conditions will, according to the laws of nature, produce seed better adapted to growing in Canada than foreign grown seed can possibly be.

P. A. BOVING,

In charge of Root Crop Investigation,

Macdonald College.

FIELD CROPS OF CANADA

OTTAWA, June 11, 1915. — A press bulletin issued to-day by the Census and Statistics Office is of special interest as giving the preliminary estimate of the area sown to grain crops in Canada for the present season and the condition of these crops on May 31, as reported by correspondents. The reports received show that in the Maritime provinces cold and rainy weather during May delayed farm work, and at the end of the month a good deal of seeding had still to be completed. In Quebec and Ontario cold winds and frost, coming after the execptionally warm weather of April, retarded growth. In these provinces the frosts injured pastures, but did little damage to grain crops. In the Northwest provinces growth was checked somewhat by cold and frosty nights, but, on the whole, conditions continue to be favourable. In some parts of Manitoba and Saskatchewan the need of rain was being felt. In Alberta and British Columbia the condition of the grain crops was generally favourable.

AREAS SOWN TO WHEAT

Wheat is estimated to occupy this year a total area of 12,896,000 acres, which is more by 1,662,500 acres, or 14.8 p.c., than the area sown for 1914, and more by 2,602,100 acres, or 25 p.c., than the area harvested in 1914, the area sown for last year having been reduced by 939,600 acres, the estimated aggregate of total failures through the winter-killing of fall wheat (211,500 acres) and through drought affecting spring wheat (728,100 acres). Not only is the wheat area this year, under the double stimulus of patriotic impulse and high prices, 25 p.c. in excess of last year's harvested area; but it is also the largest area ever sown to wheat in Canada. As previously reported the area to be harvested of fall sown wheat is 1,208,700 acres, the balance of 11,687,300 acres having been sown this spring. Whilst every province shows an increase in the wheat area it is the three Northwest provinces which preponderate in the national effort to produce more wheat. The total area sown to wheat in these provinces is 11,659,700 acres, an increase over last year's harvested area of 2,324,300 acres, or 25 p.c. In Manitoba the area is 3,166,900 acres, an increase of 21 p.c.; in Saskatchewan it is 6,642,100 acres, an increase of 24 p.c. in Alberta it is 1,850,700 acres, an increase of 35 p.c. Rather more than half of the total wheat area of Canada is in the single province of Saskatchewan.

OTHER FIELD CROPS.

Oats are estimated to occupy a total area in Canada of 11,427,000 acres, an increase over last year's harvested area of 1,365,500 acres, or 13 p.c., barley 1,518,400 acres, as compared with 1,495,600 acres last year, rye 106,440 acres against 111,280 acres, peas 189,470 acres, compared with 205,950 acres, mixed grains 453,000 acres, against 463,300 acres, hay and clover 7,788,400 acres, against 7,997,000 acres and alfalfa 94,480 acres against 90,385 acres.

CONDITION OF FIELD CROPS AND ANTICIPATED YIELD

Measured in percentage of a standard of 100 representing a full crop, all the grain crops were reported as showing a high average, the points being as follows: Fall wheat 94, spring wheat 96, oats and barley 92, rye 91, peas 93 and mixed grains 91. Hay and clover with 86, pastures and alfalfa with 87 are not so good, these crops having suffered from cold and frosty nights during May. Converting the points of standard condition for the principal grain crops into a scale of 100 representing the average of the past five years 1910-1914, the result,—assuming conditions between now and harvest to be equal to the average,—is an anticipated increase in the yield per acre of 15.6 p.c. for fall wheat, 2.6 p.c. for spring wheat, and 2.5 p.c. for rye. For oats and barley the indications are for yields slighly below the average, or to the extent of 1.5 p.c. for oats and 0.7 p.c. for barley.

BARRES—YELLOW—RED.—A Swedish "Yellow Intermediate" which tops the list of foreign grown mangel varieties.

CLOVER SEED PRODUCTION

Home-Grown Seed has been Shown to Give the Best Results

IN 1914 the Lands Committee of the Commission of Conservation obtained some interesting figures in connection with clover growing in Canada. Some of these are shown in the following table:

PRODUCTION OF TIMOTHY AND CLOVER SEED

(Figures given reprecent percentage of number of farmers).

	N.S.	P.E.I.	N.B.	Que.	Ont.
Saving own timothy seed.	4	55	...	35	42
Saving own clover seed....	4	31	....	13	39

AMOUNTS OF CLOVER SOWN

	N.S.	P.E.I.	N.B.	Que.	Ont.
Acreage seeded to clover..	785	733	615	2,422	3,666
Per cent of grain sown seeded to clover	82	46	52	[illegible]	40
Average lbs. per acre sown of red clover	6	2	5	3	[illegible]
Average lbs. per acre sown					

LIVE STOCK

WOOL GRADING IN QUEBEC

FLEECES of wool vary as to fineness, length of staple wool, strength of fibre, colour and percentage of shrinkage. Any of these factors may determine the use to which a particular fleece may be put. Wools under two inches in length are used in the manufacture of woolens while those over two inches long are used in the worsted process. The finer wools are used in the more expensive goods and the coarse ones in the manufacture of cheaper and coarser goods. White wools may be manufactured into white or coloured goods while black or gray wools must be kept separately. Wools of a high percentage of shrinkage are worth less per pound than those of a low percentage, because when scoured the high shrinkage wools yield less wool for a given weight than the low shrinkage wools.

Wool grading is the separating of fleeces into classes according to the various qualities which they posses. In the past grading has been performed mostly in the wool houses and mills, except in some of the large sheep raising counties where it is performed at the shearing sheds.

Grading enables the manufacturer to buy more wool of the desired grade or grades with less money than he could otherwise because he buys only those wools that he can use. When buying ungraded wools the manufacturer may buy large quantities of wool that is not suitable for his line of trade; in consequence he has considerable money tied up in wool that he cannot use, and which for the time being at least restricts his buying capacity from a manufacturing standpoint.

Although graded wool is always more suitable for the manufacturers and will bring more money to the farmer, yet on account of the small flocks kept, especially in Eastern Canada, grading was impossible until organization took place and through co-operative associations farmers were willing to grade and sell together. In this way grading became possible and the expense to each farmer is small while the benefits to be derived therefrom amount to several cents per pound.

GRADES PRODUCED IN QUEBEC. There are many grades of wool in the market and while Quebec has practically none of the fine wools such as merinos yet many of the other grades are represented. The wools of the province may be roughly divided into two classes, namely clothing and combing. Of the clothing grades the quantities are small, only wool from Southdowns and the shortest and finest of the down fleeces going into this class. The bulk of the wool in the province is of the combing class and may be graded into four grades, namely medium combing, low medium combing, lustre combing and coarse combing. Medium combing wool is the finest and may be produced by pure bred Shropshires, Oxfords, Hampshires, Dorsethorns, Suffolks and Cheviots. The staples range from two to four inches in length, soft and silky to the touch, and should be fine enough to spin fifty four to fifty six shanks to the pound. When scoured medium combing wool shrinks from 30 to 40 per cent. It is perhaps the most widely used wool on the market, being used by woolen, worsted, felt and hosiery mills. Dress fabrics, serges, shawls, flannels, blankets, hosiery, paper felts and all kinds of woolens may be manufactured from this wool. The diversity of its uses creates a steady market demand for large quantities of this wool, consequently it is usually an easy seller at fancy prices.

Low medium combing wool is usually produced by the commoner and poorer bred sheep of the medium wooled class. It is coarser and is used in the manufacture of inferior and poorer materials.

Lustre combing wool is produced by pure bred and well bred Leicesters, Cotswolds and Lincolns. It is noted for its lustre or sheen. On account of its power to reflect light it is used in the manu-

---

of alsike	3	2	3	2	4
Average lbs. per acre sown of timothy	13	8	12	8	6

The man who conducted the survey work in Ontario stated that very many of the farmers complained of not being able to secure good growths of clover during recent years. These failures may be due to one or more of the following causes; exhausted soil, insufficient quantity of seed sown per acre, inferior seed or foreign seed.

It was found on many of the Illustration Farms that, where home-grown and foreign clover seed were sown side by side, the home-grown seed gave much better results. In some cases, the difference in hardiness between the home-grown or acclimated seed and the purchased or foreign seed was sufficient to cause the crop from the home-grown seed to stand the winter, while that from the foreign seed was badly winter-killed and sometimes a complete failure. Several farmers were induced to save fields for seed who before had never produced red clover seed. The results were gratifying. On the Illustration Farm in Lanark county, Ont., 1,200 lbs. of choice seed were produced in 1914.

Many farmers pasture the second crop of clover when it would pay much better to keep it for seed. Now is the time to plan for the clover seed crop by cutting the first or hay crop early to give the second or seed crop a good chance to start. In many districts, where farmers say clover seed cannot be grown, it can be found growing along roadsides or ditches, proving that, with care, it could be grown as a profitable field crop.

There are distinct advantages from growing one's own seed. It will not likely be sown so sparingly, it will give better results than purchased seed, the danger of introducing new weeds is obviated, and, as the foreign supply is likely to be short next year on account of the war, any surplus can be easily disposed of at good prices—

Conservation

RUST IN WATER PIPES

Editor, Journal of Agriculture.—

TWO years ago I dug a spring about 200 feet from house and laid down ½ inch. block iron pipe, but there proves to be iron in the water and has nearly filled the pipes up with rust. There is only water enough to carry the ½ inch stream for I have to syphon it up a little in the spring in a very dry time. What would you advise me to do—get some galvanized pipes and lay them or put in lead pipe? Do you think lead bad for piping for use in the house? What size pipe should you advise getting? How much longer will galvanized pipe last without filling up with rust than block pipe. Kindly let me know what you would do in my place.
F. L. B.
Ayer's Cliff, P. Q.

*Ans.*s I would certainly put down galvanized iron pipe. Lead pipe is all right if the water is running continuously, but when it stands for some length of time in the lead pipe then there is danger of lead poisoning. If I were in your place I would put not less than 1 inch pipe and larger perhaps. The reason for this is that it will last a longer time without clogging up. In the case of your block iron pipe, I do not think it was the iron in the water which caused it to clog. It might be, of course, but I think it was probably simply the pipe itself which rusted from the air contained in the water passing through. If you have a pump at the house and use this pipe as a suction pipe, I would use not less than 1¼ inch pipe because it makes easier pumping.

C. J. L.

FEED THE SOIL; IT FEEDS US

By H. L. Russell, Director of the Agricultural Experiment Station at the University of Wisconsin

THE soil is of the great fundamental asset in our national wealth. Out of it come life and sustenance for the whole world of nature and mankind. Formerly it was customary to look upon it merely as a mass of inert particles, but we know that it is composed of the most complex materials and in place of being dead and inert, it is pulsing with myriad forms of life. These living organisms act and react, not only on each other, but on the complex soil particles with which they come in contact.

The processes of soil-formation are continually in the making. Weathering is slowly but constantly releasing new plant food, while at the same time the process of depletion, erosion, leaching, and waste are lessening the value of this asset.

To conserve this bank account, and to transmit it unimpaired to future generations is a duty which the human race owes to posterity, but as with nearly all of our natural resources, man has wasted more than he has used. In earlier years, when knowledge did not exist, or was imperfectly appreciated, wanton practices led to rapid depletion or exhaustion. Every virgin area that has been opened up for settlement by man has had its pioneer generation of soil-miners, but if future human life is to receive adequate support from the soil, sooner or later the soil-tiller must quit robbing the land and feed his soil as he feeds his flocks.

The last decade or two has brought the American farmer to a more complete realization than he has ever before known, of the duty that lies before him. The lessons that China and Japan learned a thousand years ago or more made their way slowly toward the occidental world. Even the teachings of old England and the plains of continental Europe fell heedless on American ears. To our fathers the so-called inexhaustible fertility of the magnificent Mississippi valley could never be used up, but the declining crop yields a section, whether it is wheat, corn, or cotton, spell lessening profit and impairment of capital.

Science has now shown in no unmistakable terms that as the chain is no stronger than its weakest link, so the soil is no richer than its content of its most indispensable element. If depleted of its potash or phosphorus, whether by age-long leaching, or more rapid robbery by careless crop-production, matters little. The effect is the same.

Therefore, the fundamental problem is to know how to manage our soils so that not only will they bear fruit but while doing so they will also retain their original fertility.

facture of articles where delicate colour shades are desired, such as lady's dress goods, coat linings, curtains, braids, serges, damasks, buntings, furniture cloth and goods of a heavy smooth nature.

Coarse combing wool is produced from poorly bred sheep of the long wooled type. It is used in the manufacture of carpets, rugs, and for knitting yarns. There is very little of this class of wool produced in the province.

The excellence of Canadian wool has never been fully appreciated by manufacturers and farmers on account of the fact that it was never sold as graded wool. However, the prices obtained by the co-operative wool associations in the province of Quebec for graded wool demonstrates the fact that Canadian wool when properly put up for market is very suitable for manufacturing purposes, and that Canadian mills are prepared to pay prices equally good as those paid for imported wools of the same grade. Grading is as yet in its infancy in the province of Quebec, and the beginning of a new field of work has just been started. Wool grading goes hand in hand with sheep improvement. The exercise of more care in the breeding of our flocks will raise the standard of our wool grades, and the higher the standard of our grades the larger and broader will be the scope of Canadian wools in the markets of the world.

A. A. MACMILLAN

A CANADIAN BLUE CROSS AMBULANCE

Editor, Journal of Agriculture.—

ON May 15th last, representatives of various Horse Breeders' Associations in Canada met in Toronto and decided to contribute a Blue Cross Ambulance to the Canadian Militia, for use of the Veterinary corps at the front. Such an outfit will consist of one horse ambulance, one transport waggon, four heavy horses to haul the ambulance and wagon, sixteen light horses for the use of the men in catching loose horses and in killing horses too badly wounded to recover, saddles, blankets, and a supply of veterinary medicines. It is estimated that all the above will cost, approximately $6,000.

At a later meeting of the Executive Committee appointed by the above representatives, I was asked, as Secretary, to write you setting forth the objects of the movement and asking the co-operation financially and in other ways of your society, in helping the cause.

The amounts given below were suggested by the representatives of the associations present at the meeting:—

Clydesdale	$1,200.
Thoroughbred..	300.
Pony..	50.
Percheron..	800.
Hackney..	200.
Standard Breds	300.
Shire..	80.

The Dufferin Park Driving Club, Toronto, has offered to give a matinee, the receipts from which will be devoted to this object.

The Committee would like to raise the balance of the amount required from Canadian Horse Societies, and other interested organizations, such as Racing and Driving clubs.

The Ambulance and equipment will be presented in the name of the Horse Breeders' Societies and kindred associations, and will be strictly Canadian, and must not be confounded with the British Blue Cross Ambulance organization.

Awaiting your early and favourable reply, I am,

Yours faithfully,

H. M. ROBINSON,

Secretary.
Canadian Horse Breed Societies
and Kindred Associations

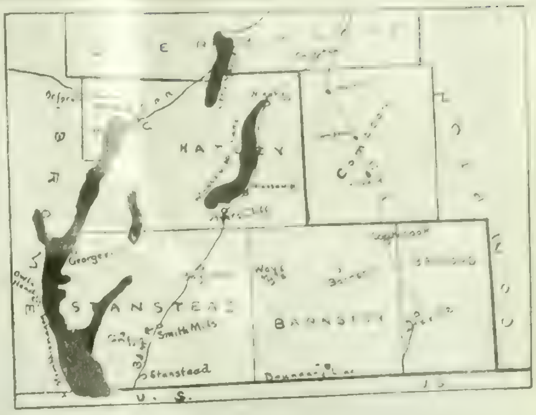
Toronto, June 12th, 1915.

AGRICULTURE IN STANSTEAD COUNTY

A Review of Agricultural Conditions and Progress

THERE may be more productive counties in Quebec than Stanstead, but for picturesque beauty and lovely home settings none can surpass it. The hills, valleys and lakes have that peculiar scenic attraction which makes it hard for its people to sever home ties and go to new parts.

Structurally, Stanstead County forms the middle part of the three-ridged extension of the Appalachian range that runs northeast from the Green Mountains of Vermont, and its hills and valleys conform to this general direction. The beautiful Lake Memphremagog forms the western boundary of the country, and near the centre lies Lake Massawippi, also famed for its lovely scenery.



Map of Stanstead Co

The People. Stanstead was one of the first of the Eastern Townships to be settled after the Revolutionary war. Most of the land was taken up by sturdy U. E. Loyalists from Vermont and New Hampshire, and by later accessions from these states. As might be expected, there is much affiliation of family interests with those of Vermont and New Hampshire, and the people for a long time looked to these states as their natural markets before they had railway connections with Sherbrooke, Quebec and Montreal.

In recent years French-speaking people have gone into the county in large numbers, so that now about half the population belong to that nationality. The following table will show at a glance the drift of population during the last ten or fifteen years.

AREA AND POPULATION OF STANSTEAD COUNTY.

	Acres.	Population 1901.	French speaking 1901.	Population 1911.	French speaking 1911.	Improved Land. Acres.	Field Crops.
TOWNSHIPS.							
Barford	35,140	1,527	1,229	943	767	12,485	7,788
Barnston	63,041	2,482	862	2,342	1,061	31,964	19,514
Hatley.	57,464	2,508	973	1,295	260	13,447	8,369
Magog	35,253	852	398	865	468	9,601	7,000
Stanstead	71,646	2,832	286	2,954	492	31,568	23,441
TOWNS and VILLAGES.							
Coaticook		2,880	1,631	3,165	2,019		
Magog		3,516	2,545	3,978	2,920		
Ayer's Cliff . .				316	21		
Beebe Plains . .		477	141	808	220		
Dixville		430	82	404	100		
Hatley, N. . . .		261	88	498	169		
Rock Island . . .		615	256	861	388		
Stanstead Plain. .		618	253	837	424		

	English Speaking.		French Speaking.		Rural.		Urban.	
Stanstead County.	9,959	9,794	8,744	10,655	10,201	9,898	8,797	10,867
	1901.	1911.	1901.	1911.	1901.	1911.	1901.	1911.

Soils. The soils are somewhat varied in composition, but generally speaking they are sandy in texture. In the valleys they are heavier and richer through admixture with alluvium and clays, and there fine crops are produced and herds grow fat on the rich pastures. On the hillsides too, many fine farms are located, but more careful management ie required there to conserve the fertility of the soil. The rougher areas are admirably adapted for sheep grazing, but thus far this industry has never been "boomed" to any great extent.

Industries. Dairying is the chief industry and many fine herds of cattle may be found in the county. In 1911 there were 18 butter factories, producing 1,901,375 lbs. of butter, and five cheese factories, producing 169,070 lbs. of cheese. How-

A view in Stanstead County. Looking towards Lake Memphremagog from the home of Otis Brown near Smith Mills.

The house and barn of Mr. Holmes, near Way's Mills, Stanstead Co.

ever, with the increased demand for milk and cream in the cities of New England in the last few years a considerable amount of these products are now sent by train to the Boston markets.

As a rule, the dairymen do not grow enough feed on their farms, and as a result much costly feed must be bought, which reduces the net profits very much. Many pure-bred dairy herds of Shorthorns, Ayrshires, Jerseys, Brown Swiss, and Holsteins are to be found in the county, but it has not yet earned a reputation among outside breeders. This may be accounted for, we believe, by the fact that too many breeds are represented in the county. If the breeders would concentrate their efforts on one or two breeds, as the Chateauguay breeders do, they would make greater headway on account of mutual helpfulness, and at the same time they could offer greater attractions to outside buyers.

Many young cattle are prepared cheaply for the market on the large areas of pasture available, and the raising of hogs and poultry is a profitable side-line on most farms.

Agricultural progress has been delayed in Stanstead, as in most other counties, by the lack of cooperation. This year, however, the Stanstead County Co-operative Agricultural Association was organized through the efforts of Mr. Emberley, the Macdonald College demonstrator, with the object of promoting the interests of the farmers both in buying supplies and in selling their produce. The success of the Wool Growers' Association and the Egg Circles shows may be done by proper organization.

The barn belonging to Mr. Otis Brown.

The Work of the Demonstrators.—Ayer's Cliff is the headquarters of the Macdonald College Demonstrators on account ot its central location. Mr. A. F. Emberley, B.S.A., assisted this summer by Mr. G. C. Boyce, B.S.A., is doing much valuable work along many lines and has got into touch with a large proportion of the farmers.

It is impossible here to go into detail regarding the projects he has in hand; a mere mention of them must suffice. He has five experimental plots of alfalfa, and three variety tests of ensilage corn on different farms; demonstrations in pruning and spraying orchards were carried out at seven places; arrangements were made for treating seed oats for smut and potatoes for scab; many tests were made for the acidity of soils; plans were made with schools for competitions in the autumn school fairs; egg-circles were organized at Ayer's Cliff, Smith Mills, North Hatley, Fitch Bay, Dixville, Coaticook and Magog; a wool Growers' Association was formed at Ayer's Cliff; and as already mentioned, a County Co-operative Agricultural Association was organized. In addition, much help and advice are given at the office on sundry matters.

A fine Jersey heifer, belonging to the herd of E. O. Baldwin, Coaticook.

During the writer's visit to this county in June he saw many instances of the fine service of the demonstrators and of the cordial relationship between them and the farmers of Stanstead.

Farms Visited. Through the kindness of Mr. Emberley the writer was able to pay short visits to several of the best farmers. He was unable, however, during the two days at his disposal, to visit the townships of Hatley, Magog and Barford. Way's Mills is the centre of a good farming section and stops were made at the farms of Mr. Holmes and P.B. Buckland, both having sons at Macdonald College. Near Coaticook Mr. E. O. Baldwin has purchased a fine farm of 275 acres, and has a herd of 80 pure-bred Jerseys of which 33 are milking at the present time. Incidentally Mr. Baldwin told us that he made $104 the previous week from these 33 cows. He is building a barn to accommodate 100 head and making other large improvements on the new farm.

Near Boynton a stop was made at the farm of Mr. W. E. Hunt, who has a large flock of sheep, mostly Oxford and Shropshires, and some fine Shorthorn cattle.

Mr. Otis Brown, near Smith Mills, has a fine farm of 325 acres and possesses some excellent Ayrshires and two-year old Percherons. He has an up-to-date commodious round barn.

Mr. A. Mackay has a good farm of 200 acres. He believes in Shorthorns and showed us a fine bull that has taken many prizes at the exhibitions. He has a herd of 30 cattle, and a large flock of sheep.

Mr. Arthur Curtis, near Stanstead Plains, is also a Shorthorn breeder. We saw there an excellent plot of alfalfa which has given large yields during the last two years.

Major H. G. Curtis is a Holstein enthusiast, and showed us a fine herd out at pasture. He has a large area under crop.

Messrs Ralph Libby and Charles Standish, near Ayer's Cliff, have some fine specimens of Brown Swiss cattle. These breeders have been instrumental in getting a registry of Canadian Brown Swiss established at Ottawa.

Some of the Herd of Holsteins belonging to Major H. Curtis, Stanstead Plains.

Women's Clubs. The women of Stanstead County have organized several clubs under the direction of Miss F. Campbell of Macdonald College. These clubs are doing excellent work in bringing the women together not only for the discussion of community interests but also for the promotion of the social side of rural life. There seems to be no question as to their possible influence in making home and country life more attractive for both young and old and in redressing many community ills which the men folk would not or could not change.

General Impressions. A two-day's trip among the farms of Stanstead County, especially when made in an automobile, enables a visitor to meet many farmers and business men whose opinions on agricultural matters are worthy of consideration. In the course of the trip he forms certain impressions which may be stated here briefly.

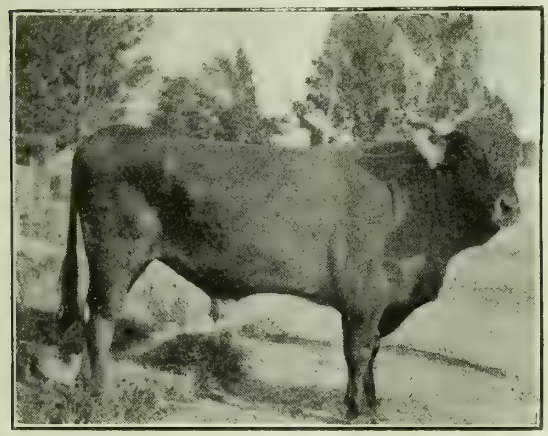
1. The farmers are doing well in a financial way, and while few are rich, the majority are comfortably situated.
2. The construction of many miles of fine roads shows that the people are alive to their economic value.
3. The presence of many fine school buildings and of several young men at the Macdonald College is an indication that the people of Stanstead are alive to the importance of an educated farming community.
4. The Co-operative spirit is beginning to grow and spread; when fully established much greater returns will be recorded from the farms.

An Alfalfa field on the farm of Mr. Arthur Curtis, Stanstead Plains.

Brown Swiss Cow belonging to C. Standish, Ayer's Cliff.

5. As we have already stated, too many breeds of cattle are to be found in the county. For obvious reasons better returns would be secured if the efforts of the breeders were centred on one or two breeds.

6. Sheep raising and grazing should be a prominent industry in Stanstead county and could very profitably be carried on in addition to the dairy industry, on the large areas of rough hilly pastures.



Brown Swiss Bull belonging to Mr. Ralph. Libby, Ayer's Cliff.

7. More clover, alfalfa, corn and roots should be grown to provide rough fodder for stock.

8. More attention might very profitably be given to the planting and care of orchards.

W. L.

THE SIXTH ANNUAL SHOW AT ORMSTOWN

Under the Auspices of the Live Stock Breeders' Association of the District of Beauharnois.—A great sucess and a fine Display of Live Stock

Gathered at the Ormstown show were four hundred and fifty horses—chiefly Clydes and harness animals; four hundred cattle—Ayrshires, Holsteins, Jerseys, Shorthorns and grades; one hundred and thirty sheep—Leicesters, Oxfords, Shropshires, Hampshires, Southdowns, Dorset Horns and Cheviots; seventy-five head of swine—Tamworths, Berkshires, Yorkshires, Chester Whites and Duroc Jerseys; and about four hundred head of poultry. An entry list of 1,455 at a show during these times of stress and strain speaks volumes for the optimistic spirit of the farmers in the community.

Providence was kind and gave them ideal weather. The Federal Government was kind and sent the Live Stock Commissioner down with a cheque for $2,500. The Provincial Government of Quebec went them one better and doubled the amount, and last but not least, the farmers turned out and gave them a crackerjack good exhibit of live stock of all kinds. Naturally, there was nothing else to it, the spectators just had to flock to Ormstown, and come they did, enough to break all former records for attendance. The races, too, were an added feature this year, and while they could very well be dispensed with from an educational standpoint, they no doubt also helped to swell the attendance.

The judges in the different divisions were as follows: Heavy horses, Adam Scharf, Cumming's Bridge, Ont.; light horses, Dr. E. Watson, Hudson Heights, Que.; Ayrshire cattle, Alex. Hume, Menie, Ont.;Holsteins and Jerseys, Prof. Barton, McDonald College, Que.; sheep, C. E. Bain, Taunton, Ont.; swine, R. J. McNeil, Ormstown; poultry, W. H. Reid, Kingston, Ont.

Clydesdales

Clydesdales were again the main feature of the horse exhibit. Both the yearling and two-year-old imported classes showed the effects of no importing this year, but the exceptional quality and strength of the Canadian-bred stuff in every class more than made up for any deficiency in the imported classes. The chief exhibitors of the breed were: R. Ness & Son, Howick, Que.; Ormsby Grange Stock Farm, Ormstown, Que.; Wm. Nussey, Howick Station, Que.; Taylor Bros., Ormstown; W. Beatty Atherstown, Que.; Jno. McGerrigle, Ormstown; R. Todd, Lachute, Que.; Donald McCormick, Brysonville, Que.; Sam McGerrigle, Ormstown; Albert Nussey, Brysonville; Geo. White, White's Station, Que.; J. C. Steele, Allan's Corners; David Pringle, Huntingdon, Que., and others.

The largest exhibitor of pure bred imported and Canadian bred Clydesdales was R. Ness & Son. At the head of his string came the famous Sir Spencer now eleven years old, but in the best of condition and with action that draws the attention of all eyes when he is in the ring. With the splendid sire was Spencer of the Briars a Canadian-bred Ottawa champion. The champion mare Ruby Gem (imp.) with Lady McTaggart (imp.) and Woodside Rosebud and several other stable companions were a credit to any breeder. Their condition was not to be wondered at when the stable had been visited and the horses seen enjoying their evening meal of silage, crushed oats, and bran. The high price of feed has not caused any stinting in the feeding of these show champions. Dr. D. McEachran of Ormsby Grange, Ormstown had a good showing of Clydes including Selborne (imp.) and Countess of Afton.

Ayrshires

It was only natural that the Ayrshire breed should be the centre of interest. The herds belonging to R. R. Ness,, Hector Gordon, D. T. Ness and Jas. W. Logan are known throughout the Dominion, but it is only at their own local shows that these herds come in direct competition. At none of the bigger shows is the judges task so hard, yet the men know the relative good points of the cattle so well that while competition is of the keenest, they usually know how the awards will be placed. R. R. Ness with his unbeaten Dominion winner Hobslands Masterpiece carried off the championship in the aged bull class, and the special for the best bull. Loch Fergus Cherry from Hector Gordon's herd won the female championship, junior male champion being Ayrmant Gay Lad a yearling bull of great promise from the same herd. Junior female premier honors went to Burnside Lady Fanny the property of R. R. Ness.

The judging of the graded herds each consisting of a bull, a cow and three heifers was one of the best features in the show. Representatives from five herds competed, and the sight as the animals stood in line was one of which the community might be justly proud. At the heads of the lines stood Armand Gay Lad (yearling), Hobsland Masterpiece, Holehouse White Heather, and Hobsland Bonnie Boy, the first named looking small beside his aged brothers. First honors, however, fell to him and Hector Gordon led him away in triumph. The other Ayrshire awards were very evenly divided. Evidence of this was noticeable in the bulls, in five classes the firsts went to five different breeders.

Holsteins

Practically the same exhibitors were out this year in Holsteins as were seen last, with the exception of P. J. Salley's herd from Lachine Rapids. The exhibitors included Neil Sangster, Ormstown; J. Alexander, St. Louis Station; Alex. Younie, Ormstown; A. McNeil, Ormstown; John McRae, Howick; J. Helm, Huntington; Jas. J. Howden, St. Louis; H. H. Craig, Howick, and others.

Aged bull—1, Gano Faforit Posch, Sangster; 2, Pontiac of Pleasant Valley, Alexander; 3, Johanna Rue Indulge, Jas. Winter, Ormstown. This class was not as strong as has been out other years, but with the exception of the first prize bull none were shown in good fit.

Two year old bulls were headed by Paul's King Segis Beets Walker, a straight, well-fleshed bull who stood third in senior yearlings last fall at Toronto. W. Scott, of Tatehurst, second on King Segis Hengerveld Pietertje, and Geo. Moore's Don Inferno third. Gano Lindenwood won for Thos. Moore in the year old bulls. The standing in senior bull calf was: 1, Sangster; 2, G. McWinnie; 3, Robert Milne; 4, J. J. Alexander. Junior bull calf went to Robert Kerr, with Sangster, 2 and 3. Champion bull, Gano Faforit's Posch.

Cows in Milk

Aged Cows—Roda's Princess, a right good dairy type of good size and conformation, topped a strong class of a dozen good matrons, with Edna of Pleasant Valley second; Power Scopt Queen, third, and Dot of Ormstown, fourth, all were Sangster entries.

Sangster was 1 and 2 again in 3 year old cow in milk, with J. J. Alexander 3 and 4. The two year heifer in milk went 1, 2 and 3, Sangster.

Dry Cows—1, Lulu Cornucopia, Younie; 2, Minto De Kol, Alexander, and 3, McNeil.

2 year old heifer (dry) —1, Daisy De Kol, Younie; 2, Spot Pietje, J. Helm; 3, Artis Posch De Kol, Helm; 4, Princess De Kol, Howden.

Junior Yearling—1 and 2, Sangster; 3, John McRae; 4, J. Helm.

Senior heifer calf—1 and 3, Sangster; 2, Alexander.

Junior heifer calf—1, Helm; 2, Paul; 3 and 4, Sangster.

Champion cow—Roda's Princess (Jr. champ.) Daisy De Kol.

Produce of cow—1, Sangster; 2, Younie; 3, Sangster.

Get of Sire—1 and 2, Sangster; 3, Helm; 4, Craig.

Senior and champion herd—Sangster.

Jerseys

The Ormstown people enjoyed a real treat in the Jersey exhibit. B. H. Bull & Son, Canada's largest Jersey breeders, were on deck with an excellent exhibit, including many from their new importation.

Sultanne's Raleigh was at the head of the herd, his first appearance in Canada east of Ottawa. He has already been champion at the Ontario fairs, as well as west to Victoria, B. C.

Brampton Mon Stockwell was first prize two-year-old bull. He is by Brampton Stockwell and out of a R. O. P. dam. This bull was an easy winner last year at Toronto. It is worthy of note that he is by the same sire as Brampton Stockwell Rose, the first prize two-year-old heifer, who is under test for R. O. P., and will finish her year with over 8,000 lbs. of milk, testing over 5.59 per cent. Brampton Patricia, who has been a most successful winner throughout Canada, was given second place to a magnificent daughter of Bright Prince, Brampton Maitland's Bright Side. She was just imported this spring, and is entered for R. O. P. test.

There were three local exhibitors of Jerseys, Messrs. Rousseau, Gibeau and Winters, but in every case the Brampton animals were placed first.

Shorthorns

Shorthorns were represented by the herds of E. Baxter, North Georgetown and Haddon Kerr, Riverfield, the firsts and specials going to the former.

Grade Cattle

The classes for grade cattle were well filled and competition was keen. H. H. Craig won the grand herd prize, also the Holstein grade special.

Sheep and Swine

The sheep classes were well filled in the Leicester and Shropshire breeds. In the former breed four exhibited, John Purcell, Huntingdon; J. A. Goodall, St. Louis; D. Pringle, Huntingdon, and James Bryson, Allan's Corners, making a fairly even division of the prizes. The specials for best Leicester displays went to J. Purcell. J. R. Roy, Ormstown, R. Hunter, St. Etienne; Jas. Elliott, Tatehurst and Geo. Moore, Dewittville entered some excellent specimens of the Shropshire breeds, all championship and special honors going to the first named. In the Oxford Down classes, Robt. Kerr, Riverfield and R. Hunter divided the prize money. A. A. Ayer won all classes in the Cheviots, and divided honors with R. Hunter in the Southdown classes.

A few breeders divided honors in the swine classes. J. G. McGerrigle won the special for best sow and boar any breed, Geo Hooker, Osmstown that for best display of young pigs, and Jas. Donaldson, of Ormstown the special for best bacon boar.

The Grand Parade

Forty-one Ayrshires, twenty-three Holsteins, and sixteen Jerseys—all winners including many champions—circled round in a grand parade to the delight of over five thousand people gathered in an arena that can hardly be surpassed in the whole Dominion. Such was the scene at one of the evening performances held in Ormstown, Que., in connection with the show held under the auspices of the Live Stock Breeders' Association of the district of Beauharnois.

The Ormstown District

Of all the live stock sections in the country, Beauharnois, Chateauguay and Huntingdon Counties—often called the "Canadian home of the Ayrshire"—can hardly be surpassed, and the people are justly proud of the fame the performance of their stock has brought them. Some of the breeders are well known exhibitors at the leading shows from coast to coast, but in addition to them there is hardly a farmer whose stock is not fit to put in the ring. Many of the cattle and horses are either imported or bred from imported stock, and in cases where grade cattle predominate, there is usually a pure bred bull at the head of the herd.

YOUNG MEN'S JUDGING COMPETITION

An interesting feature of the Ormstown Live Stock Show recently held was the Inter County Judging Contest, a trophy donated by Prof. Barton, Macdonald College, being given to the winning team to hold for a year, or if won three years in succession by the same county team it becomes their property.

Teams representing Chateauguay, Richmond and Huntingdon competed. Entry was restricted to two year college students and farmers' sons under the age of twenty-five. The winning team. Chateauguay, scored 889 points, Richmond 839½, and Huntingdon 818. The winners led in the horse and cattle classes, Richmond in swine and Huntingdon in sheep. Messrs. D. Gruer, E. B. Muir and J. Lang were the members of the winning team, the two former being Macdonald College students.

The entries in the individual judging classes numbered seventeen. The heavy horse class was won by W. H. Elliott, Ormstown, with Hy. Fowler, Kingsbury, second. W. H. Elliott and D. Todd, Lachute, won in Holsteins, and E. B. Muir, Howick, and Innes MacFarlane, Huntingdon, in the Ayrshire classes. It is worth noting that of these six winners, five of them were Macdonald College students, who had received considerable instruction in judging live stock, and had learned to write down the reasons for their placings. One of the rules of the competition provides that "each contestant will be required to place the animals in order of merit and write his reasons for placing all the awards in the class." It might be to the advantage of the younger farming community to have judging competitions at more of the local shows.

SUMMER CARE OF FARM FOALS

The first summer is the time when growth can be put on the colt, cheapest and most profitably. Plenty of feed is necessary for best growth and development. Of all feeds, the mother's milk is of greatest importance. It is essential that the dam be cared for in such a way as will cause her to yield the biggest supply of milk possible. Mares suckling foals should be fed liberally of clean, healthful, and appetizing foods. It is permissible and usually advisable that the mare be worked. She should, however, be in the hands of the most thoughtful, careful driver and should be handled with good judgment.

Feed and Pasture

After the age of about one month the foal needs food in addition to what it can secure from its mother. Clean, bright oats makes probably the best feed that is available on the farm. A mixture of oats, bran and oil meal in proportion of 6-3-1 is splendid if one will go to the trouble of preparing or mixing a feed. Ordinarily a colt will learn to eat the first mouthful from the mother's feed box but he cannot get enough there. He must have a small box out of reach of the mare, or some place where larger and older stock cannot reach it.

Good pasture is highly important in securing gain and growth. In fact there is no one thing so necessary aside from the mother's milk. If the mare is worked in the field, she and the colt should have the best grass pasture possible at night. Care must be given that pastures are not overstocked and that variety of grasses or succession of pastures is provided to avoid the dry grass in summer. The mare relishes grass and her milk flow is stimulated and increased by good pasture. The colt relishes grass, gets needed exercise, and will thrive best where pasture is abundant.

If the mare and colt are running on pasture, supplemental feed will be needed just the same, especially when the grass begins to dry up. A feeding place should be constructed in such a way that young colts can enter and older stock cannot. Grain should be fed liberally in this separate pen.

Management

Colts should not follow mares at work in fields during summer and fall. They should be left in clean stalls, paddocks or pastures where they cannot hurt themselves. Colts love company and where there are a number of colts on the farm, they should be in the same stall, paddock, or pasture while the mares are in the field. Good sense and judgment must be used in allowing the youngster to suckle at noon and evening.

It is very necessary to keep the colt free from accident. Wire cuts, nail pricks, and bruises produce severe losses on many farms where colts are grown. To just the extent that a man keeps his colts free from accident, he increases his profits. Old sagging fences must be straightened up; corner posts must be set; broken boards with nails in them must be gathered up. Every precaution possible must be taken to guard against injury because it means the saving of money.

Flies, too, must be guarded against by having the barn clean and by having manure piles and all breeding ground for flies cleaned up. Shelter from the hot sun in summer is another factor that increases the growth and thrift of the colt and increases the profit to the owner.

It pays well to handle the colts the first summer. They should be broken to halter. Their feet should be picked up and whenever they need it, trimmed. If they are handled the first summer, much of the work of breaking later will not be necessary. Good care and management the first summer will cause the colt to become a bigger and better horse and a more profitable farm product.

H. E. McCARTNEY,

Purdue Univ.

EXPORTATION OF WOOL

Editor, Journal of Agriculture:—

I beg to state that a new Order now permits the exportation of wool grown in Canada to the United States, under a guarantee that the wool shall be used for manufacturing purposes only in the mills of that country, and that no part of the wool, nor any of the wool tops or yarn made therefrom shall be re-exported from the United States.

Applications for licenses to export wool grown in Canada should be made directly to the Department of Customs, Ottawa, where full information will be furnished. Under these arrangements the markets of the United States will be open to the wool growers of Canada.

Yours faithfully,

JOHN BRIGHT,

Live Stock Commissioner

Ottawa, May 31, 1915.

APPLICATION AND CARE OF FARM MANURES

(Continued from June Issue)

When the supply of manure is limited, it is more profitable to apply four to six tons to the acre than to apply a larger quantity to fewer acres. In general farming where there is only a moderate supply of manure produced, applications of four to eight tons to the acre will be found most advisable.

The practice of treating manure with some kind of phosphate is commendable. For immediate results, acid phosphate is preferable to raw rock phosphate, though either will give good results in the end.

SHEEP RAISING

(Continued from May Issue)

What Care Will Do

The man who gives his sheep better care will very much increase the quality and the quantity of his wool, and there is no reason why Ontario, which is so well suited to raising the best sheep in the world, should have to import wool; but that is the case to-day. We find that the average clip of the sheep of this country is a little less than three and three-quarter pounds each, and it might just as well be six pounds, if we exercised care in the management of our sheep. The better care the sheep get, the more wool they will produce.

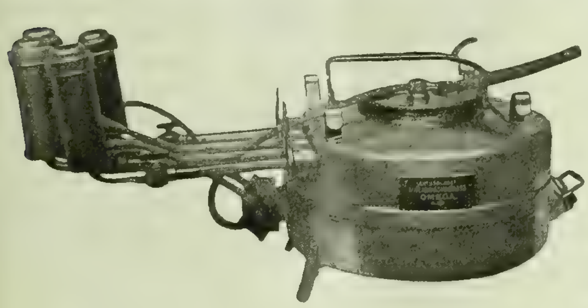
In order to produce the better quality of wool, dipping is necessary. We should improve our stock and we should use well-matured sires. I do not mean that lambs will not produce good stock,

THE DAIRY

THE AMO MILKING MACHINE

JUST at present a new milking machine is being introduced to the Canadian farmer, which shows some improvements over the types in use and deserves special mention in this paper.

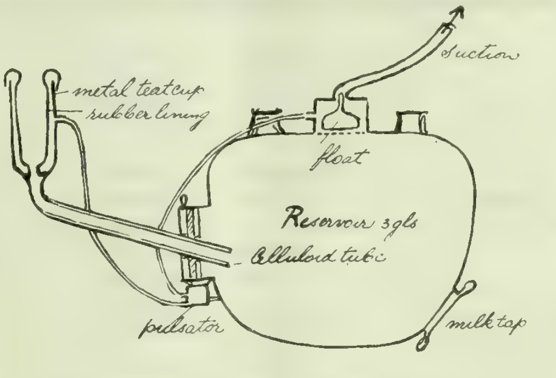
The machine is manufactured by a Swedish company which has been making milking machines for the last 18 years under the name of the Omega milking machine. A couple of years ago they broke away from the old established principles and appeared with a new machine which under the name of *Amo* milking machine received the highest praise in England in 1913. Since then the machine has been successfully introduced in Australia and New Zealand, and government officials in these countries recommend the machine warmly. In this article we will not discuss the sanitary possibilities of the new Amo machine, but from a practical farmer's standpoint the machine looks very promising.



The drawing showing a cut through the machine needs very little explanation. There is a tinned iron reservoir holding about 3 gallons of milk which is supported by two straps passing over the back of the cow. In front of the reservoir is a patent tap to empty out the milk; at the back are four openings through which pass the celluloid tubes going to the teat cups, and the pulsator is also placed here, which regulates the pressure on the teats of the cow. The teat cups are of a well known pattern, having a solid rubber lining and in the side of the metal cup is a tube connected with the pulsator. On top of the pail is the connection of the suction pump, so that the air used in the pulsator does not pass through the milk, reducing bacterial infection from the stable air.

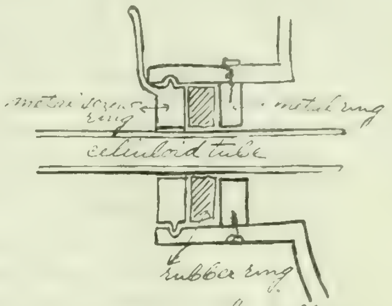
Taking up the different parts more in detail we will see where the differences and improvements on existing machines appear.

The teat cup is of the general pattern as used by the Sharpless machines here and the Lawrence-Kennedy machines in Australia. Certain improvements have been introduced. For example the rubber, lining is grooved and the grooves are of much thinner rubber, so that any pressure applied will cause the rubber to squeeze the teats only in the grooves. Inside the teat cup and the reservoir a vacuum of about one half an atmosphere pressure is maintained, whilst outside the rubber lining of the teat cup we have alternately the same vacuum or atmospheric pressure, subjecting the teats to a squeezing motion.



Cut through Amo. Milking Machine

However, we prefer the latest B.L.K. teat cups on account of the fact that they contain hardly any rubber, a decided advantage from a hygienic standpoint. The tubes conducting the milk from the teat cup into the pail are made of strong clear celluloid and constitute a great step forward. This celluloid is as hard, smooth and clear as glass and can be cleaned as such. It does not bend and there is an even start from the teat to the pail, assuring a regular milk flow. Besides the operator can watch the milk all the time. The air-tight fastening of the tubes into the pail is also very simple. (Drawing No. 2) A rubber disc is placed between two metal rings, the outside one having a coarse screw edge. The least little twist presses the screw ring against the other one and the rubber ring being pressed on both sides flattens out and fastens the celluloid tube airtight in the pail.



Airtight connection for celluloid tube

Further question of interest to our farmers such as the cost of upkeep, quickness of milking, etc. will be taken up at a later date. Suffice it here to say that at the trials of the Royal Agricultural Society of England in 1913 the Amo received first prize. The following data are taken from this test:—

	Amo	Other machines
Milk obtained per cow. . .	18 lbs.	16 lbs.
Strippings	1.2 "	1.3 "
Milking time.	6.75 min.	10.5 min.

J. VANDERLECK

---

but I think more mature sires should be used, and will give better results.

We should look well to the little things that count so much in the sheep industry. There are several things that we must observe; the foundation stock, the best system of feeding and care should be carefully studied by the farmer. All these things are very simple if they are taken from the right standpoint. I have received letters from farmers during the present year, asking how many sheep I would advise them to keep on a 150-acre farm. Unless a man is well experienced in the sheep industry, a small flock will give him very much better returns than a large one. It is better to grow up with the business, because there are difficulties in the sheep business as well as in any other. By going into it in a small way you will be able to develop the business and you will be doing your duty to the country equally as well as the man who goes to the front to fight his country's battles.

Dogs and the Sheep

A great many men say that dogs drove them out of the sheep business, but I believe that ten men have gone out of the sheep business that were never bothered with dogs for every one that goes out on account of dogs. I believe that if the dog laws were thoroughly enforced we would soon get rid of the dog trouble. Bells on the sheep are one of the best protections against dogs. Any farmer who wants to keep a small flock of sheep can, for a few dollars, fence a small field, dog proof, near his barn, where he can train his sheep to come every night and where they will be away from the dogs. Notwithstanding the difficulties that are in the way of sheep raising, the farmer that keeps a small flock of good sheep is doing an important duty to himself and his country.

CHAMPION COWS OF EACH BREED

FOR the information of our readers we give below the names of the cows of each breed holding the highest semi-official yearly records in their several classes, these records being correct to May 1, 1915, according to the secretaries of the several breed associations. This report is worthy of preservation and we would suggest that it be cut out and pasted in the herd book or some other book of convenient reference. In this way it will be easy to note changes of placement as new records are made.

Where both the milk and fat records are not held by the same cow, each cow holding these records is given under her appropriate class in the following tables:

AYRSHIRE

Class	*Name*	*Milk Lbs.*	*Fat Lbs.*
5 years old and over	Auchenbrain Brown Kate 4th	23,022	917·60
4½ to 5 yrs.	Miss Nox 3d	15,015	576.94
4 to 4½ yrs.	Agnes Wallace of Maple Grove	17,657	821.45
3½ to 4 yrs.	Elizabeth of Juneau	15,122	536.15
3½ to 4 yrs.	The Abbess of Torr	14,582	640.72
3 to 3½ yrs.	Ethel of South Farm	15,056	589.20
2 to 3½ yrs.	Beuchan Ermine	15,186	516.64
2 to 3½ yrs.	Castlemain's Nancy 4th	14,495	547.45
2 to 2½ yrs.	Jean Armour 3d	14,987	599.91

BROWN SWISS

5 years old and over	College Bravura 2d	19,461	798.16
4½ to 5 yrs.	Betty of Allynhurst	13,349	542.66
4 to 4½ yrs.	Merry of Allynhurst	14,371	578.87
3½ to 4 yrs.	Alpha Girl	12,990	534·85

POULTRY

THE PRESERVING OF EGGS IN THE HOME

By W. A. Brown, B.S.A., Live Stock Branch, Ottawa

EGGS are a perishable food product, and while their production is distributed throughout the year with much greater uniformity than many other food products, yet it is a fact that new-laid eggs are usually scarce and high in price between the months of October and February, and plentiful and comparatively low in price in the spring and early summer months.

The cost of preserving eggs by artificial refrigeration is considerable, and while it is not believed that any liquid preservatives will give better results than those obtained in well built and carefully managed cold storages, yet it is conceded that there are times when those consumers who will go to the trouble and take the necessary precautions, will find it to their advantage to preserve a reasonable quantity for home use.

METHODS OF HOME PRESERVATION RECOMMENDED

As the result of much technical investigation and years of practical test it has been found that the best results can be obtained from the use of water-glass and lime-water. While the lime water method is undoubtedly less expensive and just as efficient, yet popular opinion seems to be constantly growing in favour of water-glass.

THE USE OF WATER-GLASS

Water-glass is a solution of silicate of soda, and may be obtained from practically all druggists. A 10 per cent solution is generally used, that is one part of water-glass is mixed with nine parts of water.

The water should first be boiled in order to destroy all vegetable or animal substances contained therein. The two substances are then thoroughly mixed, and the solution allowed to stand until it becomes quite cold before using.

LIME-WATER METHOD

Previous to the advent of artificial refrigeration, lime-water was used commercially to a large extent. Some large dealers still use it to supplement cold storage, and many people use it as a home preservative. Although authorities differ somewhat as to the relative amounts of lime and water to be used, the proportions of 2 pounds of lime to 5 gallons of water are generally recommended. It is important, however, that the water take into solution as much lime as it is capable of holding. A quantity of fine salt in proportion of about 1 pint to the above is also frequently added. The mixture should be kept well stirred for a few hours, and then allowed to settle. The supernatant liquid is then drawn off, and poured over the eggs. In order that the solution may be kept saturated and of uniform strength throughout it is customary to add a litttle lime from time to time, or better, to keep a cloth covered with lime just touching the surface.

CONTAINERS

Any receptacle that is impervious to, and does not corrode in, water is suitable for holding the eggs. Glazed earthenware crocks, galvanized tubs or buckets, or wooden tubs or kegs are most frequently used. In the case of wooden receptacles it is desirable to let them stand filled with water for several days, and then to scald them and cleanse them thoroughly before using. For home consumption it is best to have a number of small containers holding not more than five or six dozen each. Covers should be placed over all containers and these, when filled, should be stored in a cool, dry place in the cellar.

THE SELECTION OF EGGS FOR PRESERVATION

Best results are obtained from eggs which are put down in April and May. At this time, eggs are not only abundant and cheaper in price than later, but they are also fuller, stronger bodied, and of all-round better quality than those available during the hot weather. An important and safe precaution is to candle all eggs. This is not a difficult or complicated process, for fortunately an egg is semi-transparent when held before a light in a darkened room and permits, if carefully rotated, of even minor defects being seen. For further information with regard to the candling of eggs, see Pamphlet No. 3 entitled "The Candling of Eggs."

3 to 3½ yrs.	Ola B	15,603	548.92
2½ to 3 yrs.	Scallotta K.	9,286	454.24
2 to 2½ yrs.	Gwinilla of Allynhurst	11,312	477.10
	GUERNSEY		
5 years old and over	Murne Cowan	24,008	1098.18
4½ to 5 yrs.	Dairymaid of Pinehurst	17,285	910.67
4 to 4½ yrs.	Azucena's Pride 2d	16,204	855.70
3½ to 4 yrs.	Dolly Dimple	18,459	906.89
3 to 3½ yrs.	Johanna Chene	16,187	863.36
2½ to 3 yrs.	Langwater Hope	15,079	773.59
2 to 2½ yrs.	Cherry of Edgewater	13,454	732.97
2 to 2½ yrs.	Marshall's Lady Dudley	14,814	606.46
	HOLSTEIN-FRIESIAN		
5 years old and over	Banostine Belle DeKol	27,404	1058.34
5 years old and over	Tilly Alcartra	30,451	951.23
4½ to 5 yrs.	Lindenwood Hope	20,405	931.45
4½ to 5 yrs.	Vale DeKol Elliston	24,191	832.33
4 to 4½ yrs.	Daisy Grace DeKol	21,718	962.80
4 to 4½ yrs.	Queen of the Hengervelds	23,788	702.46
3½ to 4 yrs.	Duchess Hengerveld Korndyke	22,897	903.38
3½ to 4 yrs.	Friend Echo Elnora	23,149	732.70
3 to 3½ yrs.	Finderne Holingen Fayne	24,613	1116.05
2½ to 3 yrs.	K. P. Manor Kate	22,106	818.73
2 to 2½ yrs.	Lady Paul Livardy 3rd	20,937	737.36
2 to 2½ yrs.	Elmside Nundine Segis Johanna	22,802	706.40
Under 2 years.	Woodcrest Colantha Pietje	20,860	639.62
	JERSEY		
5 years old and over	Sophie 19th of Hood Farm	17,558	999.2
5 years old and over	Eminent's Bess	18,783	962.8
4½ to 5 yrs.	Olympia's Fern	16,148	937.8
4 to 4½ yrs.	Flying Fox's Maid	14,316	785.9
3½ to 4 yrs.	Lass 66th of Hood Farm	17,794	910.6
3 to 3½ yrs.	Lass 74th of Hood Farm	13,714	747.6
2½ to 3 yrs.	Lass 73rd of Hood Farm	10,953	659.4
2½ to 3 yrs.	Salem's Golden Lucy	11,891	609.6
2 to 2½ yrs.	Pearly Exile of St. Lambert	12,345	816.1
2 to 2½ yrs.	Lass 66th of Hood Farm	14,513	720.5
Under 2 yrs. old	Lucky Farce	14,260	635.8

Hoard's Dairyman

SEPARATE CHICKS ACCORDING TO SIZE AND SEX

THE younger the chick the more rapidly it increases in weight, but any undesirable conditions will check growth more seriously then than when the chick is older and better developed. Chicks of different ages should not be raised together. The older ones will crowd the younger ones and poorly developed chickens will result. Raise the growing stock of various ages in separate flocks as it is only in this way that the majority of good mature birds can be obtained.

The separation of the chicks according to the sex is also necessary. The time for separating varies according to the breed. In the Leghorns and other small breeds it is advisable to separate the sexes when the chicks are seven to nine weeks old. In the Plymouth Rocks, Wyandottes, Rhode Island Reds and other general purpose breeds separation should be done when the chicks are about four months old.

After being separated the pullets should develop to normal size so that they will be in good laying condition at the proper time in the fall and the majority of the males should be in market condition as soon as possible. A few of the males may be kept as breeders while the rest should be sold as broilers or roasters according to the breed and market conditions.

M. A. JULL

THE FORMATION AND STRUCTURE OF THE EGG

By M. A. Jull, Manager and Lecturer Poultry Department

IN the early history of our poultry the hens laid only a very few eggs—perhaps two or three each in one year, and these were laid in order that they might produce moee poultry to keep up the race. The sole purpose of egg-laying at that time was to reproduce their own kind and thus keep the race of poultry in existence. Such is still the case with wild birds. They only lay a few eggs each year, enough to reproduce themselves and keep their race from dying out. Now with domestic poultry it is quite different. When man first began to use the wild fowl's egg for food, he then began to breed and care for these fowls, so that they would lay more eggs, and to-day we have hens laying as many as 250 eggs in one year.

WOMAN'S WORLD

FOODS AND FOOD PREPARATION

Lesson XVI

FISH

Protein or Nitrogenous Foods.—Fish

FISH is a very desirable source of protein at this time of year, especially the lean varieties. The craving for pork, mutton or even beef is no longer keen and fresh fish which may be cooked and served in so many appetizing ways appeals not only to the more delicate, but to those also who are "bearing the burden in the heat of the day."

Chemical Composition of Fish.—Protein and fat are the chief nutritive constituents found in fish, just as they are in meat. As regards the relative nutritive value of meat and fish it has been discovered from a large number of investigations that the only considerable difference is in the proportion of water and fat present, the flesh of the fish having water where meat has fat. Fish usually contains less fat than is found in meat. There is, however, so much difference in the fat content of the various kinds of fish that it is convenient to divide them into three classes:

1. Fish which contain over 5% of fat, e.g.
    Salmon,
    Shad,
    Herring, and
    Spanish Mackerel.
2. Fish which contain from 2—5% of fat, e.g.
    Halibut,

THE FORMATION OF THE EGG.

The organs of reproduction in the hen are the ovary and oviduct on the left side of the body. Although the right ovary and oviduct are formed in the embryo at the same time as those of the left side, they degenerate more or less completely in the course of development so that only functionless rudiments remain. This would appear to be correlated with the large size of the egg and the delicate nature of the shell, as there is not room for two eggs side by side in the lower part of the body cavity.

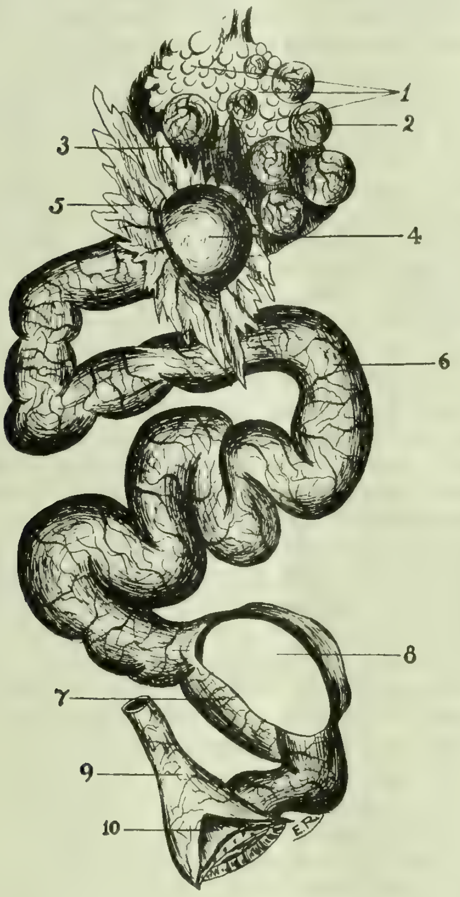


Fig. 1.—Reproductive organs of the hen: — 1. Ovary; small immature eggs or ovamature eggs or ova. 4. Matured ovum entering the oviduct. 5. Mouth of the oviduct. 6. Oviduct. 7. Lower part of the oviduct (uterus). 8. Fully formed egg in the oviduct just after the shell has been secreted. 9. Rectum, posterior portion of the digestive tract. 10. Cloaca or opening from the oviduct into the rectum.

The ovary lies at the anterior end of the kidney attached by a fold of the peritoneum to the dorsal wall of the body cavity. In a laying hen ova of all sizes are found. The blood supply of the very vascular ovary is derived from the dorsal aorta and the veins open into the vena cava inferior.

The oviduct is a large coiled tube which begins in a wide mouth with fringed borders, the ostium tubae abdominale (funnel or infundibulum) opening into the body-cavity near the ovary. It is attached by a special mesentery to the dorsal wall of the body-cavity, and opens into the cloaca.

Divided into:—

1. the oviduct S. S.
2. the uterus.
3. the vagina.

An ovary and oviduct are shown in the illustration, and the size of the ova can be seen in numbers 1, 2, and 4. Number 3 shows the remaining lining of one of the ova after the lining has burst and the ovum has escaped into the mouth of the oviduct as shown in numbers 4 and 5. Number 4 is the ovum which has escaped from number 3.

The oviduct is the large coiled tube shown in the illustration. Here is seen the mouth of the oviduct actually swallowing one of the ova.

The yolk or ovum proper escapes by rupture of the follicle along a performed band the stigma, into the infundibulum which swallows it, so to speak, and it is passed down the oviduct by peristaltic contractions of the oviduct. The escape of ovum from the follicle is known as ovulation During its passage down the oviduct the ovum becomes surrounded by layers of albumen secreted by the oviducal glands. The shell membrane is secreted in the isthmus and the shell in the uterus. The ovum is fertilized in the uppermost part of the oviduct and the cleavage and early formation of the germ-layers take place before the egg is laid. The ovum takes about from 18 to 30 hours to traverse the oviduct.

THE STRUCTURE OF THE EGG

The most external structure of the egg is the shell. On the surface of the shell of a new-laid egg is the bloom, of much the same nature as that found on fresh fruit. The bloom gives the egg a dull appearance and it serves to protect the egg from infection.

The shell is of organic material, being impregnated with calcerous salts. It is the last structure of the egg to be formed in the oviduct, the calcerous salts being deposited around the albumen and yolk while the egg is in the uterus. The shell is composed of three membranes and is full of pores.

Through the pores the interchange of gases takes place between the interior and exterior air, allowing for the process of respiration during incubation. The embryo in its development requires oxygen, which is admitted through the porous shell, and by this means also carbon dioxide passes from the embryo to the outside.

Lying close to the shell are the shell membranes, which are in two layers, called the inner and outer shell membranes. These are closely attached to one another, except at the large end of the egg, where they are separated somewhat to form the air space. These membranes are porous and allow of the interchange of gases.

Filling the space inside the shell membranes is the white or albumen of the egg, in the centre of which lies the yolk. The albumen makes up the greater part of the egg. It is largely transparent in color and is viscous in nature.

At opposite poles of the yolk, and apparently attached to it, are the two chalaza, composed of coiled membraneous layers of dense albumen. The chalaza were formed in this way by the secretion of the albumen as the yolk passed down the oviduct in a rotary motion. The function of the chalaza is to keep the yolk in its correct position in the centre of the egg and to moderate any unsteady movement of the egg, which might be injurious as far as incubation is concerned.

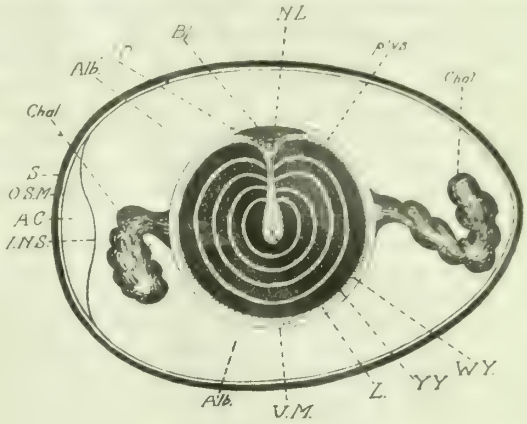


Fig. 2.—Showing the structure of the egg of the fowl (after Lillie), S. shell; O.S.M., outer shell membrane; I.N.S., inner shell membrane; A.C., air cavity or air space; Alb., albumen; Chal., Chalazae; V.M., vitelline membrane; Y.Y., yellow yolk; W.Y., white yolk; L., latebra; N.L., neck of latebra; N.P., nudens of Pander; p'vs., per-vitelline structure; Bl., blastoderm.

The yolk is golden yellow in color, spherical in shape, and about an inch in diameter. It is surrounded and held in shape by a thin vitelline membrane.

It is composed of two portions, yellow and white yolk. These two portions are formed in alternate concentric layers, first a layer of white yolk, then a layer of yellow yolk.

In the centre of the yolk there is formed the latebra, which is a flask-shaped structure made up of white yolk. The upper portion of this flask-shaped structure is called the neck of the latebra. The function of the latebra is to assist in keeping the yolk in its proper position.

Just above the neck of the latebra there is a small structure called the nucleus of Pander, which serves as a cushion for the blastoderm. The blastoderm is the germ of the egg. It is in the blastoderm that the chick starts to develop.

The yolk exhibits on one side, normally the upper side, a small whitish circle. This circle contains the blastoderm and it is always on the top side of the yolk, regardless of the position of the egg. This occurrence is accounted for in the lesser specific gravity of the blastoderm and of that portion of the yolk immediately surrounding it. Such a condition, in which it is protected so carefully, would lead to the belief that it must have an important function to perform. The necessity of such a careful provision for its safety is made clear when it is remembered that within the blastoderm life in the embryo is first manifested.

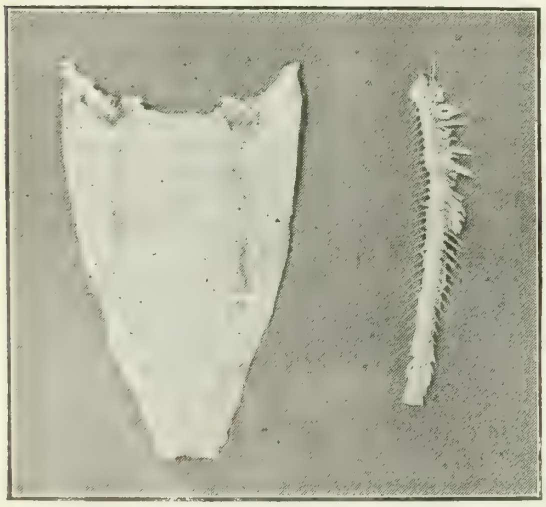
Mackerel,
Mullet, and
Whitefish.

3. Fish which contain less than 2% of fat, e.g.
   Smelt,
   Black Bass,
   Cod,
   Haddock,
   Brook Trout,
   Hake,
   White Perch,
   Pickerel,
   Pike, and
   Flounder.

Like meat fish is essentially a nitrogenous food, but the relative proportions of the nitrogenous constituents are different from those in meat, fish containing more gelatine (about four to three in meat). Fish is also much poorer in extractives than beef, which is the cause of its lack of flavor as compared with meat and it is this which makes a fish diet apt to prove monotonous. Another noteworthy point is the large amount of water in the flesh of the leaner varieties of fish — considerably more than in lean meat

Nutritive Value of Fish.—The value of fish as a source of energy depends entirely on the amount of fat which it contains. Fat fish, such as salmon, are fully equal to moderately fat meat in this respect, while lean fish, owing both to the absence of fat and the presence of more water are of considerably lower nutritive value. It may be reckoned, one authority states, "that 1½ pounds of cod or other white fish are only equal in nutritive value to 1 pound of lean beef. Fish is equal to beef as a source of energy."

Fish and the leaner kinds of meat are deficient in materials which yield heat and muscular power. When, however, fish and meat are supplemented by bread, potatoes, rice, etc. a diet is provided which will supply all the demands of the body, provided some *cellulose rich* food is included. Where fish can be obtained at low cost it may with advantage furnish a considerable portion of the protein required, and under most conditions its use may be profitably extended on the sole plea of variety. Lean fish is a very suitable form of protein in convalescent diet and in the feeding of children. Most physiologists regard fish as particularly suitable food for persons of sedentary habits, because it seems to be less "hearty." Fish, being poor in extractives is, therefore, a less stimulating food than meat and is more suitable in the diet of epileptics.



Haddock — scaled, cleaned and boned, ready for stuffing and baking.

There is a widespread notion that fish contains large proportions of phosphorus and on that account is particularly valuable as brain food. Investigation has shown that the flesh of fish is not richer in phosphorus than the flesh of other animals used for food and also that phosphorous is no more essential to the brain than nitrogen, potassium, or any other element which occurs in its tissue, which proves that there is no foundation for such a theory.

Fish in the diet allows of much variety. The fish dish may be either fat or lean fish. The different methods of cooking fish and the variety of appetizing fish sauces makes it a very easy matter to overcome what would otherwise prove a monotonous or flavorless food.

Fresh fish, like fresh meat, may be preserved by salting, smoking, or canning, thus further allowing of variety in a fish diet. Canned sock-eye salmon, finnan haddie, kippered herring, dried smoked herring (Digby chicken) and salt cod are always welcome dishes and furnish a real treat for either breakfast, dinner or supper. There is no more delicious dish for breakfast than a nicely broiled or boiled salt mackerel.

Digestibility of fish.—Authorities differ somewhat in this matter, but on the whole it has been proven that lean fish are better borne by the stomach than the fat, and are apparently more easily digested than an equal quantity of meat. The fat found in fish seems to be particularly apt to bceome rancid and thus render its digestion difficult.

Again, fish as a rule has a much shorter fibre than meat, and these muscle fibres are arranged in flaky masses which are easily separated from one another. Hence fish lends itself to comparatively speedy digestion. Of course fish differs greatly in digestibility, the lean kind being more readily disposed of than the fat, and salt fish, owing to the hardening of the fibre during salting lingers longer in the stomach than fresh fish.

An important feature must not be overlooked, viz. that the digestibility and nutritive value of fish as in other foods largely depends upon the cooking (and serving) of it.

How to Choose Fresh Fish.—In buying fresh see that the eyes are bright and prominent and the flesh firm, not flabby. The gills should be of a distinct pink color—lack of color indicates staleness.

Care of Fresh Fish.—Fish should be removed from the paper at once, carefully washed in plenty of cold water and then placed on a clean paper to have the entrails removed. Care should be taken to remove all clotted blood from the region of the back bone. This is done by persistent scraping with a paring knife. The fish should then be placed in a pan of clear cold water, carefully washed, drained and then placed on a plate in a cold place, covered and away from flies.

Preparation of fish for Cooking.—

1. *Scaling.*—Remove scales, if any, by drawing a knife over the fish beginning at tail and inclining knife slightly towards you; wipe thoroughly inside and out with cloth wrung out of cold water.

2. *To skin fish.*—With sharp knife remove fins along back and cut off a narrow strip of skin the entire length of fish. Loosen skin on each side from bony part of gills and carefully draw off skin. If flesh is soft, work slowly to keep from tearing.

3. *To bone fish.*—Clean fish, remove head, and beginning at the head, run a sharp knife under back bone, cutting away the flesh carefully all along and close to the small bones on either side. Pick out any small bones remaining.

4. *Fish Fillets.*—A piece of fish, large or small, freed from skin and bones is a fillet. Small fish are boned, skinned and cut in halves. Large fish steaks are divided into fillets and rolled for frying. Cut steak into pieces about one inch wide and skewer with small wooden skewer or pick. Egg and crumb and fry in deep fat.

Ways of Cooking Fish.—

1. *Boiling.*—A long fish kettle, containing a rack on which to place the fish, is useful. Fish steaks should be tied in a piece of cheese cloth for boiling. Add salt and lemon juice or vinegar to water. Lower fish into boiling water and simmer from ten to forty-five minutes, depending upon the thickness of piece. Serve with a fish sauce.

Halibut steak, 2 inches thick, cooked on oak plank. A border of Duchess potatoes and boiled young carrots is added just before serving. Parsley is used as garnish.

2. *Broiling.*—Broil first on flesh side,—if a white fish, split fish down back and lay out flat on broiler, flesh side down. Large fish are cut in inch slices. Turn often. Spread with soft or melted butter after it is placed on platter.

3. *Frying.* — Clean and wipe dry, egg and crumb and fry. Fish steaks, e. g., halibut, may be cut into fillets, rolled, skewered and breaded. Small fish are cut in halves, boned and skinned for frying. A fritter batter (unsweetened) may be used instead of eggs and crumbs.

4. *Sautéing.*—Fish may be seasoned and dredged with flour, or breaded. Sauté slowly (about twenty-five minutes) until well browned.

5. *Baking.*—Small fish may be boned, stuffed and baked on a fish sheet. In place of a fish sheet strips of cotton placed under the fish will easily lift it from the pan.

6. *Planking.* — (Suitable for fish steaks or whole fish). If the fish is to be cooked whole clean and split, then bone. Lay on plank, spread out with skin side down. Sprinkle with flour, salt and pepper, and dot over with butter. Bake twenty-five minutes in a hot oven. (A fish steak two inches thick requires three quarters of an hour). Garnish with lemon and parsley.

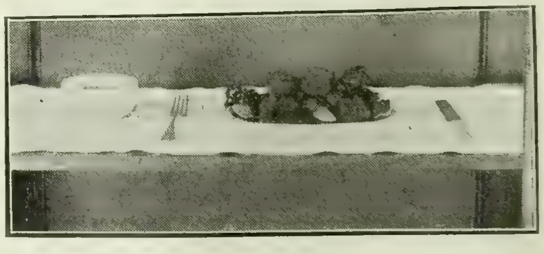
Note: Planks may be bought ready to use, or they may be made of birch or oak—oval, with a groove about one and a half inches from edge. Oil plank well with olive oil before using the first time. Always heat it before using.

Creamed Fish.—Flake cold cooked fish in large pieces, using a fork and knife and removing all bones. Mix carefully with an equal quantity of cream sauce and serve in timbal case, romequins or on toast. For a garnish, chopped white of hard cooked egg may be mixed with sauce and the yolk forced through sieve and sprinkled over top.

Fish and Potato Croquettes:—

1 c. cold flaked fish.
1 c. mashed potatoes.
Salt and pepper to taste.
1 egg or 2 egg yolks.
2 tblsp. butter.

If potatoes are cold melt the butter and mix it wtih the fish, potatoes and other ingredients. Season carefully. Minced parsley, celery salt and a little onion juice are desirable. Shape and crumb, egg and crumb again. Fry in deep fat. Serve on a hot platter garnished with parsley and slices of lemon.



Fish turbans garnished with eighths of lemon and sprigs of parsley. Hollandaise Sauce is served with it.

Note: Cold, chopped, cooked meat, as chicken, beef, or veal may substitute the fish.

The whole egg may not be needed. It depends on moisture of fish or potatoes. Add part of egg at first.

Note: To prepare crumbs.—Put through fine knife or food chopper or roll on pastry board, left over pieces of stale bread that have become crisp. Sift these crumbs. Before crumbing cut crusts from bread. Use the brown crumbs for first rolling of croquettes and the white crumbs for the last rolling of croquettes.

Fish Soufflé.—

2 c. milk.
2 c. finely flaked fish.
½ c. bread crumbs.
4 tblsp. flour.
3 tblsp. butter.
3 eggs.

1. Make a sauce of the liquid, flour, butter, salt and pepper.
2. Pour this gradually while hot into the beaten yolks, stirring constantly. Cook over boiling water for about two minutes.
3. Add fish and cool mixture to lukewarm.
4. Fold in stiffly beaten egg whites.
5. Pour mixture into buttered pudding dish or individual moulds and bake in a very moderate oven in a pan of hot water (as a custard) until mixture is "set."

Cod Fish Balls.—

1 c. salt cod fish.
2 c. potatoes.
1 egg.
1 tblsp butter.
Pepper.

Wash fish and pick apart, removing bones. Prepare potatoes in small pieces. Add to fish and boil until potatoes are tender. Drain, dry well and add beaten egg and pepper. Beat until very light, form into balls on a spoon and fry.

Salmon Loaf.—

1 c. salmon.
1 c. stale bread crumbs.
2 beaten eggs.
½ c. milk.

Mince salmon, add bread crumbs, eggs and milk. Season to taste with salt, pepper, parsley and lemon juice. Put into a mould and steam or bake thirty minutes. Turn from the mould and serve hot with white or Hollandaise sauce. Remnants of a baked fish and its stuffing may be used in place of the salmon and bread crumbs.

Fish Sauces.—

Cream or White Sauce.—

2 tblsp. butter.
2 tblsp. flour.
¼ teasp. salt.
1 c. scalded milk.
Pepper to taste.

Tomato Sauce.—

1 c. stewed and strained tomatoes.
1½ tblsp. flour.
2 tblsp. butter.
½ teasp. sugar.
Salt and pepper to taste.

Note: A little onion, a bit of bay leaf, a sprig of parsley, 2 peppercorns, a dash of celery salt may be cooked with the tomatoes. One, or all of these seasonings may be used.

Maitre d'Hotel Butter.—

¾ tblsp. lemon juice.
¼ c. butter.
½ teasp. salt.
Pepper.
½ tblsp. finely chopped parsley.

Cream butter and mix in other ingredients. Chill and cut into small circles. Serve on steak or fish.

Hollandaise Sauce.—

½ c. butter.
2 egg yolks.
1-3 c. boiling water.
1 tblsp. lemon juice.
¼ teasp. salt.
10 grains cayenne.

Wash butter in ice water, and cream. Beat egg yolks and add 1-3 of the butter and lemon juice. Beat over boiling water in an earthenware bowl until butter melts, using a wire whisk. Add another 1-3 of butter and beat until it melts, add remaining butter and again beat. Stir in water. Beat one minute and season. Serve at once with fried or sauted fish.

E. B. RUTTER,

Macdonald College

SECOND ANNUAL CONVENTION

OF THE QUEBEC HOMEMAKERS' CLUBS

THE Second Annual Convention of the Quebec Homemakers' Clubs took place at Macdonald College, June 15th and 16th, 1915. Forty-one representatives from the various clubs were present. The first session opened with singing "O Canada," followed by an address by Principal Harrison, in which he expressed his pleasure at having the delegates from the clubs meet at Macdonald College, and extended on behalf of the College a hearty welcome to all. Miss E. L. Baker, secretary of the County Executive of Missisquoi County, replied, thanking Dr. Harrison for his words of welcome, his address filled, as she expressed it, with good common sense, and for his kindness in placing Macdonald College at the disposal of the Convention.

The report of Miss Campbell, Demonstrator for the Clubs, showed that since the last convention the Clubs had increased from eight to thirty-three, and the membership from 252 to 633. Owing to the fact that other patriotic clubs had been formed in their communities the Clubs formed at Stanstead, North Hatley and Waterloo had been obliged to discontinue their work. The number of lectures and demonstrations given by the Demonstrator were 14, and in connection with the January Short Courses 14, making in all 28; the number of organization meetings held 31, and the number of clubs organized 25; lectures and demonstrations by others members of the Household Science Staff 7; and lectures and demonstrations by members of the Staff of the School of Agriculture 2. Since September last the Clubs have been busy with patriotic work, knitting and sewing for the Red Cross, and raising money for the Patriotic and Belgian Relief Funds. Large quantities of supplies have been sent in, as well as considerable sums of money. The Clubs already engaged in this good work were urged to continue it until peace comes again, and it was suggested that those lately organized take up the work as soon as possible.

The following resolutions were brought before the Convention, discussed, but not adopted: (1) Resolved that the Department of Education be approached on the subject of the care and beautifying of school grounds and their surroundings. (2) Resolved that the Minister of Education be approached on the subject of compulsory education and free books, not for the majority, but for those who are not in a position to bear the expense of the books. (3) Resolved that the Minister of Inland Revenue be approached on the matter of the inspection of clothing and footwear, that a government stamp be the guarantee that the cloth be as represented. It was moved by Mrs. Kirby and seconded by Mrs. Armitage that Miss Baker, the secretary of the executive, correspond with the secretaries of the clubs of the other provinces, in regard to this matter. The motion was carried. It was suggested that the correspondence appear in the Journal of Agriculture and the Canadian Home Journal.

On account of the fact that the annual convention is not held until nine months after the annual meetings of the branch clubs and county executives the question of changing the dates of the latter was brought up. After considerable discussion it was moved and seconded that the club year for the branches end March 31, the annual meeting for the branches be held in April, the annual meeting for the county executives be held in May, and the reports be sent in to the Demonstrator not later than June 1. The motion was carried.

The following is a copy of the program carried out at the Convention:

PROGRAMME

Tuesday, June 15
10.00 a.m., Room 207, Main Building.
Presiding, Miss S. J. Armstrong, Bristol.
Opening Chorus
"O CANADA"
Address of welcome.
Dr. Harrison
Reply to Address of welcome.
Miss E. L. Baker, Dunham
10.30 Report of Demonstrator.
Miss Campbell
11.00 Reports of County Executives.
2.00 p.m. Assembly Hall.
Presiding, Mrs. John MacNeill, Elmside.
2.00 "The Educational Needs of Farm Women".
Mrs. G. E. Kirby, Cookshire
Discussion led by Mrs. Beach
The Journal of Agriculture.
Professor Lochhead
3.30 Organ Recital.
Mr. Stanton
4.30 Reception in the Men's Residence to Delegates and Club Members.
7.30 p.m. Assembly Hall.
Presiding, Mrs. G. M. Beach, Dunham.
7.30 Song (Selected).
Master Herbert Race, Montreal.
"Our Ancestors and their surroundings" (Illustrated).
Professor Derick
Song (Selected).
Master Herbert Race, Montreal.
Wednesday, June 16.
10.00 a.m. Room 207.
Presiding, Mrs. David Todd, Lachute.
10.00 "The Relation of the School of Household Science, Macdonald College, to the Girls of Quebec Province".
Miss Fisher
Discussion led by Miss Amy Hodgins
11.00 Reports from Branch Clubs.
2.00 p.m. Room 207.
Presiding, Mrs. Jas. McKell, Riverfield.
2.00 Reports from Branch Clubs (cont'd.).
2.30 "Women and the war".
Professor Derick
General Discussion.
4.30 Afternoon Tea, served in The Apartment to delegates and Club Members.
7.30 p.m. Room 207.
Presiding, Mrs. Earle Martin, Magog.
Piano Solo.
Miss Hill
"Medical Inspection of Schools".
Dr. Marion Hansford
"The Rural School".
Professor Laird
Discussion led by Mrs. Hurdman.
Solo (Selected).
Miss Curwell
GOD SAVE THE KING.

Judging from the enthusiastic discussion follow-

OF GENERAL INTEREST

FISHING FOR SMELT

THE Restigouche River—flowing easterly into the Bay de Chaleur—is rich in natural resources. Its waters teem with salmon and trout, which prove a fruitful harvest to the busy sportsmen in search of the beauties found in its pools.

During long months the river is frozen over, the ice making a bridge for the traveller from one province to the other, and affording an opportunity for the prosecution of a thriving industry. Over forty years ago Charles Brown of Escuminac began to fish smelts in the Restigouche River, and the late J. P. Mowatt of Campbellton exported the first smelts sent from the Restigouche. Gradually the industry increased, until now over two hundred licenses are issued annually. In order to fish smelts a license from the fishery overseer must be obtained at a cost of $2.00. Two kinds of license are granted,—stationary and roving. The former secures a specified spot to the holder from the

---

ing the various papers read it seems safe to say that the Homemakers' Clubs are and will be to a greater degree every year a force for the improvement of the home, the school and the community.

That their visit to the College was thoroughly enjoyed by the delegates is evidenced by the following resolutions passed at the last session: (1) That a motion be made to convey to Sir William Macdonald the thanks of this Convention and their appreciation of the benefits conferred and the advantages afforded to the Homemakers' Clubs of the Province of Quebec, by being able to hold their annual Convention here in the institution which owes its existence to his generosity. (2) That thanks be tendered to Dr. Harrison for his invitation to the Homemakers' Clubs to hold their Convention here; to Miss Fisher for her great kindness and her interest in Homemakers' Clubs; to Miss Campbell for the perfect arrangement, for carrying out to such successful issue this second Convention; to Professor Bunting who conducted the drive Tuesday morning; to Professor Bunting for conducting the party through the Horticultural Department, and to all who have so perfectly and pleasantly entertained us.

The closing words were spoken by Dr. Harrison, who expressed his personal pleasure at meeting the delegates, and the hope that they should continue to meet in greater numbers each year at Macdonald College.

THE HOMEMAKERS' CLUB AND THE RURAL SCHOOL

(Continued from June issue.)

IF the community is too poor to provide the money for a properly equipped and up-to-date place for its children to be trained, then it is high time that the government should be informed of the fact and matters remedied. If the money be forthcoming for improving the culture of grain, the raising of hogs, or the conservation of forests, it will surely be easily obtained for the proper training of the future members of parliament. Women of the Homemakers' Clubs, get busy! Aim to have in your community a school a little better built and equipped than the best sheep pen in the Province of Quebec. This may not be secured all at once, but begin trying for it and in the meantime set your wits to work to improve existing conditions. Consider the needs of the child. He spends about a third of his waking time for at least half a year in the school building. It is properly lighted, or does the light come in through clear glass windows throwing cross lights on his work and straining his eyes? Possibly by a readjustment of the seating arrangements, or the curtaining or frosting of some windows this can be improved.

Is there provision for sufficient ventilation, or must the open window be depended upon? You cannot afford to have your child breathing over and over again the vitiated air made impure not only by his own breath and the breath of his schoolmates, some perhaps affected by disease, but also by chalk dust, and dust from the floor which possibly is not washed *even once a week.* If the windows must be used, see that they are so adjusted as to secure a circulation of air either by boards to fit the frame, or by some other means.

How is the building heated? If by a stove, is it provided with a jacket helping to distribute the heat, or are the children sitting near it suffering from overheating while those in the far corner are chilled?

What about the walls? Are they finished in an attractive colour, restful to the eyes? Fresh paint costs comparatively little, the tinting of plastered walls less.

Are the desks adjustable, or are there graded sizes to suit the pupils who occupy them? Many a case of spinal curvature has been caused by unsuitable desks, and if you think it is comfortable to sit for hours on a seat where your feet cannot rest on the floor, or some other support, just try it.

Has the room any furnishings to make it interesting to the child? Are there pictures, not atrociously coloured lithographs, but good ones which will develop his aesthetic taste, scenes of geographical or historical interest, or copies from the great painters? These can be procured from the Perry Pictures for a few cents. Are there cabinets where his nature collections may be stored, bits of rock, birds' nests, etc., etc.? Is there provision for cleanliness, or do you expect him after the work and play of a whole forenoon to eat his lunch with unwashed hands and face? A wash basin and miror cost but little, so does the supplying of a comb or brush and clean hand towel. The value in training and health is much.

Is the floor kept clean by regular sweeping and frequent washing? Of course you will see to it that it is at least as well kept as that of your own kitchen.

When you have satisfied yourself that all has been done for the building that can be done, turn your attention to its surroundings. Are the outbuildings neat in appearance, kept in good repair, properly screened, and satisfying sanitary requirements. The outbuildings of many a rural school are a disgrace. Do not forget that your child's mind is receiving impressions during his school days that are going to become fixed and form his character. See to it that these impressions are as pure and beautiful as you can make them.

Is there provision for play at this school of yours? How large is the play ground? Not less than three acres is the acknowledged amount which should be supplied. An opportunity for play is the child's birthright. It has as great a bearing on his future character as any other part of his education, perhaps a greater. It exercises his muscles and secures him physical health, it develops his imagination, it makes him keen, alert, resourceful, cultivates esprit de corps, trains him to give and take, and develops a self control that will prove invaluable to him in later life. See then that there is provision for base ball and basket ball, a turning pole for the boys, teeters and a sand pile for the little ones. Have space for a garden where flowers and vegetables may be grown and experiments in agriculture carried out. If not already there, have trees planted, both for shade and for ornament.

A third, and one of the most important phases of the work of any school, is the question of the school lunch. In the rural districts this question assumes a different aspect from that in the crowded city. In the latter it is often a case of there being no lunch, and the necessity for providing one arises. In the country no such deplorable poverty exists and yet the lunch is very often far from satisfactory. In the first place the food itself is not wisely chosen and often fails to provide proper and sufficient nourishment for the growing child. If it is worth our while to find out the proper food and the right amount which should be given to our young animals, surely our children have a right to the same attention. The subject of suitable lunches has already been dealth with in a previous number of the Journal and it is only necessary here to call attention to that article and to bulletins on the subject which may be secured by any club. The lunch should not only be nutritive but should be attractively arranged and packed, and some provision made to have it eaten in a proper manner. Something could easily be done to secure a hot dish for the children at least during the winter months. Hot soup, or cocoa, could be arranged for by club members if they once realized the value it would be to the health and efficiency of the child. Members might take it in turn to provide for the hot dish, the materials being contributed or supplied and a nominal charge made to each pupil. No child can be expected to do good work if he is not properly nourished, and a hurriedly eaten cold lunch is not sufficient during the cold months of our Canadian winter.

Having seen that the child's material wants are provided for, carry your interest further and find out something about his school work. Visit the school, you mothers and women of the district, make a friend of the teacher, bring the school and home into closer relationship; both will benefit in this collaboration. Take an interest in school affairs, go occasionally to the Friday afternoon concert, start a library and encourage the children in the use and care of books, address them sometimes on community needs or questions of broader interest. Try to secure a few good periodicals for the school, stimulate their interest in current events by perhaps offering prizes for essays on live topics, or having occasionally a special speaker address them at the school.

One more point,—the school vacation. Contrast the way in which a city child regards the summer holidays with that of his little country cousin. To the former in the majority of cases it means freedom from toil, a complete change, happy days at the seaside or in the country, play and picnicing; while to the country child it means very often extra work at home with few or no real holidays. No wonder there is envy and dissatisfaction and later no desire to remain on the farm. Every boy and girl should have some change, a few days' camping at a nearby lake or river, occasional picnics where the children can meet and enjoy themselves. Remember, childhood is but a brief period and we are grown up such a long time. And yet it is the memories of childhood and youth that come oftenest to our minds in later years. Try to make these memories happy ones, you who live among the "delectable hills" of God's wondrous heritage, the country districts of Canada.

BESSIE M. PHILP

Lowering a smelt-net.

middle of December to the fifteenth of February.

A smelt-fishing outfit is somewhat expensive. The price of a net varies from $100.00 to $150·00, according to size. The shanty, including the stove and other accessories, costs fully $50.00 more.

An outfit usually includes two nets; occasionally as many as five. There are generally two persons in each shanty. Some people fish on the mud flats, while others prefer the edge of the channel or a bar, with one side of the net near the bank, and the other in the deep water; the smelts follow a bar of sand or a point.

To protect the fishermen from the cold while fishing, a breakwind of boards is erected, and the ice is kept free from snow.

A hole is sawn in the ice from thirty to thirty-five feet long (according to the width of the net) and two feet wide. The nets are set on pickets, of which two are required, about sixty feet long. The net is pulled open by means of blocks and an endless rope. The nets are fished every five hours, being raised at high and low water. As the current slackens (the tide running out), the fisherman closes his net, otherwise it would turn inside out, and the catch would be lost. In a very short time the squirming mass of finny beauties is a frozen mass upon the ice. Catches vary from one hundred pounds to one ton, and prices range from three to five cents per pound.

Raising the smelt net, showing small catch.

The fish is usually brought at the shanties. They are placed in the freezers, sorted and packed in boxes, classified according to size, Numbers 1, 2, 4, and extras, and shipped to Boston, New York, etc.

The village of smelt-shanties (two hundred yards apart) extends from Miguasha Point to Oak Point, a distance of twenty miles. There is also a similar village on the south side of the channel; New Brunswick controls the latter and the province of Quebec the former·

Many losses and dangers are attendant upon smelt-fishing. Occasionally on account of a thaw the ice will run, carrying nets, shanties, and even endangering life. Men have been compelled to swim ashore through the ice-cold water, as the ice parted beneath their feet.

More primitive is the mode of fishing smelts on the Grand Cascapedia, where it is no uncommon sight to see the Indians—men and boys from the neighbouring reservation of Maria—sit patiently tugging at a line which has been dropped through a hole about four inches in diameter cut in the ice. A few branches of spruce and fir protect the fisherman from the wind. Slowly but surely his pile increases, and this he gladly disposes of to the first purchaser for five cents a dozen.

MARGARET GRANT MACWHIRTER

KILL THE WEEDS

ONE way to obtain increased production on Canadian farms this year is to put forth extra effort in combating weeds. This is within the reach of every farmer, and combined action will mean greatly increased yields of field crops and more lasting progress toward weed eradication.

The weed question has received considerable attention from the Lands Committee of the Commission of Conservation, and some facts have been revealed which show the real seriousness of the problem. Many of the worst weeds are getting ahead of the farmers and, unless methods of control are put into practice at once, will gain the upper hand.

In 1910, 100 farms were visited in each of the Prairie Provinces, and on 100 per cent of the Manitoba farms, wild oats were found. In Saskatchewan, 71 per cent, and in Alberta, 3 per cent reported wild oats. In 1911, on the same farms in Alberta, 31 per cent reported wild oats, while in 1912, a still larger number reported this weed, showing that it was travelling westward at a rapid rate.

In 1914, 200 farms were visited in Quebec. On 96 per cent of these farms, couch grass was found, and 82 per cent of the farmers reported it to be on the increase.

Farmers can not afford to ignore the danger from weeds. Yet there is a lamentable lack of concerted action to destroy these enemies of crop production. Land is too valuable in Canada for owners to permit 25 per cent of its producing power to be destroyed by weeds· It is time that all who are interested in agriculture realized the situation. Steps must be taken to rid the soil of the roots and the seeds. Co-operation between farmers in the same community and between farmers, the Experimental Farms and Stations, and the Governments, both Federal and Provincial, is necessary before satisfactory results can be secured. Only by continuing the fight to the end with method and thoroughness, can these enemies he held in check and ultimate freedom from noxious weeds be achieved.

Conservation

ERADICATION OF DANDELIONS

THE Dandelion, like the poor, is always with us. To maintain a lawn free from this pest means, in most parts of the country, a constant warfare, and we have at present no methods of eradication to recommend which are easy or permanent. The following methods which are employed are more or less successful according to locality and the persistence with which they are followed.

1. THICK SEEDING. Any means by which a thick, vigorous growth of lawn grass is maintained will greatly aid in the control of lawn weeds. Bare spots and thin sod invite a growth of weeds. Occasional sowing of new, clean grass seed, well raked into the bare spots, together with annual fertilizing should be practiced.

2. DIGGING THE DANDELIONS. This, the most common control method employed, is quite effective in removing the large plants, if persistently followed and properly done. Unfortunately the piece of root left in the ground is capable of sending up one to six or more sprouts from the cut end, especially if not cut deeply. A one inch chisel or long-bladed knife are suitable tools, and the work is easiest done after a rain or irrigation while the ground is soft. The plants should be cut as deeply as possible, and the plants destroyed to prevent ripening of the seed.

3. SPRAYING. The use of iron sulphate at the rate of one and a quarter pounds to the gallon of water applied in the form of a fine, forcible spray upon the lawn has proven effective, at the Agricultural College in this state, in greatly reducing the number of plants, and in some cases entirely eradicating them. Three applications about ten days or two weeks apart should be given just after the lawn is mown. No water should be applied during the next twenty-four hours. The grass will turn dark at first, but soon recovers and usually appears more vigorous than before. This work appears to be the most effective when done during midsummer and early autumn. Gasoline applied with an oil-can at the rate of about a teaspoonful in the crown of each plant is quite effective in killing the large plants, and is useful in conjunction with the other methods.—B. O. Longyear.

THE FARMER'S INCOME

JUST how much does the average farmer make? The answer to this puzzling question has been long sought by agricultural experts, since it is the ultimate test of all systems of farm management. It is simple enough to calculate the cash profits received in the course of the year, but these do not measure the farmer's success. The farm supplies him with much besides money—with food, shelter, and fuel. For these things the city worker has to pay out a large part of his wages. They must, therefore, be included in any just estimate of the farmer's income. In other words, the city worker is paid entirely in cash, the farmer partly in cash, partly directly in the necessities of life.

To obtain fuller knowledge of the value of this direct contribution from the farm the department has recently concluded an investigation which included 438 farm families divided among 10 States in different sections of the country. (United States Department of Agriculture Farmers' Bulletin 635.) The investigators found that on these farms the cost of maintaining each grown person was on the average $176 a year. This sum was composed of the following items:

Dairy products	$21
Pork	12
Poultry and eggs	12
Garden	10
Beef	6
Fruit	6
Wood and coal	13
Groceries	22
House rent	28
Labor	46
	176

Of this sum only about 22 per cent was paid out in cash. The remainder was furnished by the farm, not in the form of money but in those things for which the money would have been exchanged. The extent to which a farm can thus be made self-sustaining, made to supply the wants of the family that lives upon it without resorting to buying and selling, is indicated by conditions in the particular area of North Carolina included in the investigation.

The investigators found that in this area the average annual value of the food, fuel, oil, and shelter enjoyed by the farm family was $505. Of this sum the farm furnished directly $429, leaving only $76 to be bought.

Food was, of course, the principal item. This amounted to $401.93, of which $330.65, or 82.3 per cent, was raised on the farm. If it had not been, indeed, for such articles as tea, coffee, sugar, salt, and other groceries which it was impossible to produce at home these farms might be called actually self-sustaining. Of the animal products consumed—meat, poultry, milk, eggs, cheese, etc.—97.3 per cent were home grown; of the fruits 98 per cent and of the vegetables 96.1 per cent. Of the other articles consumed, however, and classed together as groceries, only 24 per cent was raised on the farm. The grocery bill was therefore the largest item in the cash expenditure.

This was even more apparent in other sections where the farms were less nearly self-sustaining than in this particular area of North Carolina. The bulk of the groceries was always bought but the total quantity consumed depended to a great extent upon the quantity of animal products and vegetables raised on the farm. Where these abounded the consumption of groceries diminished. From this it would seem that an obvious way to effect an important saving in expenses is to raise more vegetables and animal products on the farm. Whether it is better to cut down expenses in this way or to increase receipts by concentrating attention on cash crops is one of the great problems in farm management the answer to which in each individual case depends upon local conditions. In the past, however, many farmers have not realized the existence of the alternative. The two other important items in the cost of maintenance are house rent and labor. Both of these it is a common error to overlook in estimating the farmer's income. Since the house usually goes with the farm and the labor is performed by members of the family, both are taken for granted. This, however, is obviously unfair. In the recent investigation, for example, the investigators found that $125 was a fair rental charge for the average farmhouse, including interest, depreciation, and repairs. The fact that the farmer does not have to pay out this sum is equivalent to adding $125 to his income. With labor it is much the same. The members of the family secure by their work comforts which they would otherwise have to buy; or to put it another way, if they did the work for somebody else they would be paid.As it is they pay themselves.

It is obvious, therefore, that what the farm furnishes directly in food, in fuel, in shelter, and in rent is an important part of the farm family's income. On the other hand it must be remembered that the farmer has capital invested in his business, the interest on which must be earned before he can truly be said to be making money. In the proper relation of the three factors—interest on the investment, cash receipts, and direct income from the farm—lies the secret of successful farming.

DEHORNING CATTLE

THERE are four methods of dehorning: First, by breeding the horns off; second, by the application of caustic to the buttons on the calf; third, by the use of the gouger, or dehorning forceps (undesirable); and fourth, by the surgical removal of the horns after they have partially or fully developed.

Of these the most common is the application of caustic. In a very young calf, examination will show a callous-like portion of skin about the size of a dime or smaller, called the horn bud or button. This has scarcely any attachment to the skull, but it is the embryonic horn.

If it is desired to use the caustic method, it should be used at this stage, before the horn has passed through the skin. The agent used may be caustic soda or potash, either of which may be secured from a drug store in the form of a white stick, lead pencil size, and about five inches long. Care should be exercised in using, for caustic readily attacks the skin of the face or hands. If not already done up in paper, a piece should be wrapped about the stick to protect the hand and fingers, leaving one end uncovered for making the application.

To apply, take calf when four days old, as nearly as possible, clip the hair away from over the budding horn over a space about the size of a five-cent piece. Wash clean with soap and warm water, and dry thoroughly. Slightly moisten the uncovered end of the caustic and apply with a rotary motion to the horn buttons, first on one side and then on the other, allowing it to dry after each application. Do this about three times. Do not allow the caustic or moisture from it to touch the surrounding skin. In about a week a thick scab drops off, after which, if the operation has been successful the horn no longer grows.

In removing a fully, or nearly developed horn, the saw or dehorning knives are used. As to the relative merits of the saw and shears, the former is recommended especially for dairy cattle for aged cattle, and for the use of the small farmer; surgically, the use of the saw is to be preferred. However, the pain is not so prolonged with the knife.

The method of securing the animal will depend upon the number of animals to be handled, their size, the instrument to be used, and the operator. With a small farmer, the most common method is to secure the animal by means of a substantial stanchion, and if the saw is to be used, it is necessary to fasten the animal's head securely in some way. If a knife is used it may be necessary to fasten the head securely; but an expert assistant can readily handle most cattle by grasping the thumb and two fingers of one hand in the nose and then grasping the horn with the other while it is being clipped off.

If proper precautions are taken to treat the wound there need be but little danger from the operation. A good treatment consists in smearing the wound with coal tar or pine tar and the insertion of a cotton plug smeared with the same material into the opening in the skull. If necessary this plug can be removed in two or three days to clean the wound, after which a new plug can be inserted. Usually very little treatment is necessary, as the wound generally heals and closes up naturally.

DRYING DAMP CELLARS

THE most efficient way to dry damp cellars, basements, etc., is to use calcium chloride. Put about a pound of this salt in an old kettle, can, or similar container, that does not leak and will stand heating, and leave on the cellar floor. The above amount is sufficient for a fairly large space. The calcium chloride rapidly absorbs the moisture from the air, forming a solution in the can. This liquid should not be thrown away, but the water driven off by strong heat, leaving the calcium chloride ready for use again. With care, it will last a long time. Commercial lump calcium chloride costs about 10 cents per pound, retail. It is not the same as "chloride of lime".—C. E. Vail.

THE FAILURE OF BLOSSOMS TO SET FRUIT

THE failure of orchard trees to set fruit, in spite of the fact that an abundance of blossoms is produced, is due to one or more of several causes. These are as follows:

1. SELF-STERILITY. Many varieties of apples and pears are self-sterile. That is, they are not capable of setting fruit properly unless pollen from another variety is used. For example, Bartlett and Kiefer pears, in many locations, when they are planted in solid blocks, give less satisfactory results than when they are planted with such varieties as Lawrence, Duchess, and Anjou. With apples and pears it is good practice to mix varieties. However, if varieties with proper affinities are selected, one variety to furnish the pollen is as good as a number.

2. FROZEN PISTILS. The pistil, the part of the flower to develop fruit, is more easily frozen than other parts of flower. Hence the pistil may be frozen while other flower parts are not affected; consequently, blossoms are formed but fail to set fruit.

3. WEAK TREES. Trees in a wak condition, although blooming abandantly, often fail to set fruit.

4. RAIN AND SNOW. The pistil may be mechanically injured and the pollen washed away by rain or snow at the time when blossoms are open.

5. EXCESSIVE GROWTH OF WOOD. Blossoms often drop in great numbers when the tree is forming an excessive amount of wood.

6. OVER ABUNDANCE OF NITROGEN FERTILIZERS.

7. DISEASED BUDS.

8. SPRAYING. Heavy spraying of trees, especially before pollination has in some few instances resulted in a loss of blossoms. This is not serious however.—W. W. Robbins.

THE POTATO

EVERYBODY may think he knows the potato, but a perusal of Pamphlet No. 2, issued by the Publications Branch, Department of Agriculture, Ottawa, upon the potato will convince the same person that there is much to learn. A reprint from the Agricultural Gazette, official mouthpiece of the Department, the pamphlet is a collection of articles of superlative worth. Introduced by a brief historical statement showing the place the potato occupies in the world's domestic economy, and especially that of Canada, by which it would appear that the crop is worth to this country upwards of $41,500,000 a year, we are presented with a complete exposition of the cultivation of the tuber by Mr. W. T. Macoun, Dominion Horticulturist. Mr. H. T. Gussow, Dominion Botanist, explains, first the diseases to which the potato is subject and how they can be controlled, and next, the results of inspection under the "Destructive Insect and Pest Act." Essays telling the story of potato production in each of the province by Secretary for Agriculture, Theodore Ross, of Prince Edward Island; Superintendent of Agricultural Societies, F. L. Fuller, of Nova Scotia; Secretary for Agriculture J. B. Daggett, of New Brunswick; Professor of Agronomy, Rev. H. Bois, of Quebec; Professor T. G. Bunting of Macdonald College; Professor C. A. Zavitz, of Ontario Agricultural College; Professor J. Bracken, of Saskatchewan; Deputy Minister of Agriculture, Geo. Harcourt of Alberta; Assistant Soil and Crop Instructor, W. Newton of British Columbia, and the Secretary of the Canadian Seed Growers' Association, give weight and importance and the highest expert countenance to the reprint, which is made complete by a report telling how potato-growing contests are conducted in Manitoba and by a table of the world's production for three years. This table shows Germany to be the greatest potato-producing country and also that, excepting in Canada and the United States, the production is everywhere on the decline. Everybody concerned in potato-growing will be interested in this pamphlet and should send for it to the Publications Branch, Department of Agriculture, Ottawa.

HOW TO DEAL WITH OVERPRODUCTION*

Prof. F. C. Sears, Amherst, Mass.

WHETHER we are afraid of overproduction or not, we ought to do all we can to increase the consumption of apples and to better our markets. First: We ought to grow better quality varieties. You will at once think of the Baldwin and that if you grew anything better than that you would lose the most profitable variety you have. But I know when I was here that nobody ate Baldwins, you shipped them all to England. And I do not believe that you can expect the English to keep on eating what you won't eat yourselves. It seems to me the question of quality is much more important than we appreciate. A man eats one good apple, and he wants another one; but if he eats a poor one he does not care if he waits a week before he eats another. I am sure we do not appreciate the practical importance of this. A Boston paper recently remarked that nowadays when an American feels like absorbing an apple, he stops at a fruit stand and buys for ten cents a highly polished masterpiece which looks like perfect joy and tastes like cotton batting.

Second: We ought to have better packages in which to market our apples. The barrel, with all its good points leaves much to be desired. At our Massachusetts meeting in Worcester last week, we had on exhibition a package that had been shipped from Virginia to Brockton, and then from Brockton to Worcester. It was one of those paste board cartons which hold one hundred apples, and the man paid five dollars for it. Of course that was too much. He took out four layers and then sent us the rest, and even after they had been shipped around the country in this way, you practically could not find a singe apple that was damaged in the least. These packages can be had for 28½c a piece, and I believe they are to be one of our coming packages. This man wrote us he had bought apples packed in the western style and he had found all the apples bruised more or less, while these apples which had been shipped from Virginia were absolutely perfect.

The third point is better grading. Even you do not do perfect grading yet.

Fourth: There ought to be better distribution. We need better distribution both in time and place.

Fifth: We ought to do more to develop our local markets. I remember nobody used to ship anything to Halifax that was fit to eat, and Halifax is a city of 50,000 or more. There is no reason why they should not consume a tremendous lot of apples if you would treat them decently. I believe if you shipped them good stuff you would get good prices.

Sixth: We ought to pay more attention to by-products; the manufacture of all sorts of things out of our lower grade apples that otherwise go to waste or go into the middle of the barrel, and go somewhere else. There is an almost unlimited market for these different lines of things. In our part of the country you can buy cider apples for about twelve cents a bushel; and you can sell the vinegar produced for ten or twelve dollars, where it cost you five dollars to make it. Then there is boiled cider; they figure twelve cents worth of these apples will make seventy-five cents worth of boiled cider. This question of by-products is worth considering.

Seventh: We ought to cut out the middle man. Last year Professor Waugh and I had a fine crop of Wealthy apples. We put them up in the ordinary type of peach basket, and took them to Northampton, one of our small cities, and went to various stores. At one store the owner took five baskets, and said, "When you come next time I will take fifteen". When the team went back it went to him first, and he took the whole of the seventy-five baskets. I happened to be in the store that afternoon and I saw these apples on sale. He had taken them out of those big peach baskets and put them into those little Georgia till baskets, and he was charging thirty cents for those; that is, he was getting $1.20 for what he paid us fifty cents for.

Eighth: Fruit growers ought to do more mixed farming. I believe that the time is coming when a little more mixing of our farming will be considered as a good thing.

My last point is advertising. It is one of the biggest questions that faces the fruit man of today if he is to avoid over-production. In the first place I believe that we ought to advertise more generally the healthfulness of apples. People do not appreciate what a fine thing an apple is to eat. Just imagine what would happen if a man in the patent medicine business had a thing that looked as fine as an apple, was as wholesome as it is, tasted as good, and had a really high food value added. Any man who could corner a patent medicine with anywhere near that collection of good points would be a millionaire inside of six months! Yet we farmers do not advertise them at all, or at least not to amount to anything.

---

*Extract from an address delivered at the recent annual convention of the Nova Scotia Fruit Growers' Association.

LIFE OF APPLE TREES

Northern Climate Tends to Short Period of Fruitfulness

(Address by W. T. Macoun, Dominion Horticulturalist, at Meeting of Quebec Pomological Society.)

THE first apple trees in Canada were probably grown in the Province of Quebec. At the beginning of the 17th century the early settlers planted seeds and doubtless trees also which they had brought from France, and with them was the beginning of Apple Culture in this country. It is believed that the Fameuse apple which has a world wide reputation, originated with these early settlers. Judging by what information is available in regard to its early history which, unfortunately, is very scant, we should guess that the Fameuse must have originated about the middle of the 17th century.

There are many things which determine the age to which apple trees live in the Province of Quebec. Many varieties will not stand even an average winter. Others do well enough until a severe winter comes and then they are killed. Others again which stand winters a little colder than the average include the well known varieties, but when a real test winter comes they too succumb. Such winters apparently occurred in this Province in 1855-56 and 1862-63. In our own time we have had test winters in 1895-96 and 1903-4. These winters killed many of the so-called hardy varieties and only in favored spots did they escape.

Sunscald, a form of winter injury, is responsible for shortening the life of many trees. Root-killing also has been responsible for the loss of many. Even up to the age of six or seven years or more trees are liable to be destroyed by the depredations of mice and thousands have gone down in this way. Fire Blight has claimed its victims, through it is rarely that apple trees are destroyed with it in the Province of Quebec. Borers have taken their share. Planting in unsuitable soil has affected the age materially. And what shall we say of neglect which is responsible for materially shortening the life of countless numbers of trees. Other reasons could be given, but enough has been said to show that few trees have a fair chance to reach their allotted span of life in Quebec Province. The figures given are merely suggestive of the age which trees have reached or may reach under favorable conditions.

Believing that it would be of interest to the members of the Quebec Pomological Society and that it would give valuable information to those who may plant apple orchards in this Province in the future, the writer recently sent out letters of enquiry to a number of the fruit growers in the Province to ascertain what in their opinion and experience is the life of trees of different varieties in different parts of the Province. Where and of what variety is the oldest apple tree now living in the Province of Quebec? What is the age record for this Province?

Alexander.—The Alexander has been grown for many years in Quebec. It is one of the earliest importations of Russian apples into America and because of its hardiness, large size, and handsome appearance, it is a popular variety, although its quality is nothing to boast of. The Wolf River which is of the same type but hangs on the tree better and keeps longer, is now being planted in preference to it. The greatest age which this tree reaches in the Province of Quebec is reported by Mr. Aug. Dupuis, Village des Aulnaies, who states that trees in good clayey loam are strong and bear well at 58 years of age, although M. E. Gadbois, Rougemont, reports 50 to 60 years. Mr. E. C. Watson, Durham, states that it will reach 50 years if not too much exposed, and Mr. J. M. Fisk, Abbotsford, reports the same age, and others report trees nearly of this same age, and Mr. Brodie reports trees 50 years of age and still healthy. It is evidently a hardy variety.

American Golden Russet.—The American Golden Russet has long been grown in the Province of Quebec. It is one of the few winter varieties that have proved hardy and this fact and its good quality have made it a favourite, especially for home use, but owing to its shy bearing in most places it has not been planted on a large scale commercially. Messrs. Watson, Gadbois, Dupuis, and Fisk report trees reaching the age of 60, 58, and 50 years, respectively. At Ottawa the American Golden Russet has been killed in very severe winters and we do not consider it as hardy a variety as the McIntosh.

Baxter.—The Baxter apple has proved a disappointment, not so much through lack of hardiness of tree, but that it is a shy bearer, the apple is not good enough in quality and too many of the fruits are injured in some way or other.

Ben Davis—Ben Davis has been thoroughly tested in Quebec, and it is fortunate for the Province that it has not been found hardy enough. Many trees have been planted some of which have reached bearing and others in favored places have lived for some years afterwards. The oldest tree is reported by F. X. Gosselin, Ste. Famille, Island of Orleans, at 50 years. About 15 years seems an average date.

Canada Baldwin.—The Canada Baldwin originated at St. Hilaire, P.Q., but is not extensively planted. The tree is subject to sunscald in some places and the apple is not quite good enough in quality. Messrs. Fisk and Watson report trees 50 years of age. So that in Rouville and Missisquoi counties it reaches a good age.

Canada Red, or Roseau.—Also sometimes called Pomme de Fer. This is not the Canada Red grown in Western Ontario. It is one of the hardiest of the winter apples grown in the Province of Quebec, but the quality is not quite good enough to satisfy those who grow and eat Fameuse and McIntosh.

Reported by Mr. Fisk as reaching 50 years of age and by Messrs. Johnson Cloutier, Hitchcook, and Gosselin 30, 35, 40 and 45 years. A shy bearer at first, but like most winter varieties in the Province of Quebec, becoming more productive with age.

Duchess—The Duchess of Oldenburg is an old and well-known variety in the Province of Quebec and the principal summer apple. It was introduced into America about 1835 and doubtless has been growing in the Province of Quebec for seventy or seventy-five years. It is perfectly hardy everywhere the apple succeeds as it is one of the very hardiest sorts. As it comes into bearing very early and fruits heavily one would not expect it to reach a great age, but Gosselin reports that it reaches from 60 to 75 years of age on the Island of Orléans. Dupuis states that thees 58 years old obtained from Toledo, Ohio, are still bearing well. Several others reports from 40 to 50 years, so that it is evident it reaches a fair age.

Fameuse.—The Fameuse has, it is believed, been grown longer in the Province of Quebec than any other variety of apple at present grown there. Just what is the greatest age to which individual trees will live we do not know. The oldest trees are reported by Mr. Dupuis, who states that trees 100 years old are at St. Jean Port Joli, which were planted by the late Messrs. Fraser and Verreault. At St. Roch, ten acres of Fameuse planted in 1820 are still bearing well after ninety-four years. Mr. S. Roy, of Quebec, reports a tree 92 years of age. Mr. Gadbois, Rougemont, reports trees 80 to 90 years old, and Messrs. G. B. Edwards, Covey Hill, and Rev. Mr. Dickson, Rectory Hill, trees 70 years old. Other records are from 50 to 60 years. It appears that the winters of 1855-56 and 1862-63 were very severe, destroying many of the orchards in the Province and more recently in the winter of 1903-4 many trees were killed. It is very severe winters which occur from time to time that prevent trees reaching the great age that they do in milder climates. Along the River St. Lawrence in L'Islet County, where the river tempers the climate somewhat there appear to be some of the oldest trees at present. The Fameuse is not as hardy a tree as some of the other varieties grown in the Province and we think that in most places it cannot be counted on to last much more than 50 to 60 years.

Lowland Raspberry.—This fine summer Russian apple is only grown in a few places, but it is very hardy, fruiting in Southern Manitoba. Mr. Fisk reports the oldest trees in the province as 35 years of age.

McIntosh.—The McIntosh apple has been proved to be hardier than the Fameuse in the Province of Quebec, but there are no very old trees there yet. Messrs. Brodie and Fisk report trees in good health at 30 years, Mr. Cloutier at 45 years and Mr. Gadbois, 70 to 80 years, but these last figures may be his opinion rather than his experience as this variety was not propagated until 1835 and not disseminated to any extent until some time later. The original tree, was 112 years old when it died.

Crab Apples.—The transcendent crab is noted as reaching 50 and more years of age. Mr. Gosselin mentions 80 to 100 years. Montreal Beauty is evidently tenderer, but Mr. Fisk mentions 40 years for Montreal Beauty and 40 for Whitney.

MILK AND ITS CARE

I. Clean Milk

IT is not always fully realized that milk, as it is produced in the udder of a healthy cow, is a pure food. The task of the milk producer having a healthy herd then is to get the milk as the cow gives it and keep it clean and cold.

The bacteria which make the milk spoil and render it unsafe for human food come from the dirt, or excrement, on the cow's flanks and udder, from the dust of the barn, from dirty, and unsterilized utensils, and from the person and clothes of the milker. Accordingly, it pays to have the milk producer keep clean. He should keep his cows clean, his barn clean, his milking utensils clean and sterile, and above all he and his help should be clean and healthy. It is not necessary to wear expensive clothes to milk in, but it is important that the milker should have clean clothes and, clean hands. It is not necessary that the milker should have small, white hands with tapering fingers, but it is necessary that his or her hands be clean. It is not all essential that the dairy barn be architecturally perfect or the walls enameled and gilded, but all dairy barns should be plainly constructed, and free from unnecessary material. The walls and ceiling should be comparatively smooth, the floors, stall and mangers tight and sanitary and the room well lighted, and sufficiently large to furnish an abundant supply of air for the cows.

The most important thing is cleanliness. A clean barn, with clean cows, clean milker, and clean utensils, make clean milk.

To keep milk pure the producer must understand the meaning of cleanliness. He must know how to put this understanding into practice. Mr. or Mrs. Consumer can help him by letting him know that they understand what cleanliness means and that they are willing to pay the extra cost of producing a clean product. If the consumer and producer could get together and talk these things over the consumer would come to realize the real problems of the producer and the producer would be more reasonable and kindly disposed towards the consumer. The producer would keep his milk pure, and the consumer would better appreciate the value of a clean product.

2. MILK IN THE HOME

The quality of the milk when used, depends to a considerable extent upon the care it receives in the home. We are sometimes inclined to blame the milk man for troubles which are due to improper care of the milk after it has left his hands.

The housewife who is anxious to provide the family under her charge with a pure milk should choose her milk man carefully, should insist on bottle delivery and then when the milk comes to the house should put it promptly into the ice box and not allow it to stand on the porch, window sill or kitchen table. To allow the milk to stand in a warm room will hasten greatly the growth of bacteria and hence lessen the keeping qualities of the milk.

In opening the bottle, first wipe the mouth of it with a clean towel before removing the cap. Use a sharp pointed instrument to remove the cap, lift it with care and rinse it in clean running water before replacing it.

Mix the milk well before using it. Inverting the bottle rapidly two or three times will do this. Pour out only the amount needed for a specific purpose, and pour into clean receptacles only. Do not return any unused portion to the milk in the bottle, but place it in the ice chest in another dish.

Keep all milk containers tighly covered to prevent the entrance of dust, dirt, or other foreign matter. Do not keep more than one day's supply of milk at a time, but order a fresh supply daily.

Wash the milk bottles carefully before returning them to your milk man. In some places this is required by law. The best way to wash a milk bottle is to first rinse it out thoroughly with cold water and then carefully with very hot water. All vessels used for holding milk or cream should be cleansed in the same manner.

Milk bottles should never be used for any other purpose than holding milk or cream.

It is important to take the proper care of your ice chest. Milk will readily ansorb odors and, therefore, the ice box must be kept scrupulously clean. Strong smelling foods, such as onions and cheese, must not be kept in the same compartments with milk or butter.

Milk prepared for infant feeding in nursing bottles should be kept in the ice chest until just before using. The practice of heating the baby's milk at evening and keeping it warm until night or early morning feeding is very bad. The heat thus maintained is most favorable to the growth of bacteria.

3. WHY PASTEURIZE ?

In the process of pasteurization, milk is heated to a temperature sufficiently high to kill all disease producing bacteria without producing any changes in milk that could be detected by the senses, such, for example, as taste, smell or sight.

Not all bacteria are killed by this process, even when most carefully done. But those are killed which are capable of infecting the people who use the milk. It also kills the great majority of those bacteria which spoil or sour milk.

When the right temperature is used for the proper length of time, the bacteria remaining in the milk are harmless to man and produce only slow changes in the milk if it is afterwards kept at a cool temperature.

The dangers from raw milk, (in the case of tuberculosis) come from the cow. This danger can be avoided either by using milk only from cows which are known to be free of the disease or by pasteurizing the milk. Raw milk from cows which have not been tested for tuberculosis is always dangerous and for children much more dangerous than it was formerly supposed to be. No one can justify his action, in this day and generation, in feeding young children raw milk from untested cows. All cows producing milk to be used for human food should be tuberculin tested. Where milk is not received from tested cows it should be pasteurized to prevent the ever present danger from tuberculosis.

The other reason why milk should be pasteurized is that in this way we can get the only absolutely safe milk. The reason for this is that typhoid fever, scarlet fever and diphtheria carriers may handle the milk and unknowingly infect it. The tuberculin test protects the consumer from tuberculosis but pasteurization protects the consumer from all danger and furnishes him with a perfectly safe milk.

This, of course, is true only when pasteurization is properly done, which, unfortunately, is not always the case. In order to kill all disease-producing bacteria in milk a temperature of 145 degrees F. should be secured and kept for half an hour. This is not always done. Sometimes, the same results are expected by heating to a higher degree for a shorter time. This process, however, is not advisable. What are called flash or instantaneous pasteurizers are sometimes used. The results from this class of machines are always unreliable. Furthermore, milks are sometimes properly pasteurized but afterwards subjected to the danger of infection by careless handling, by hand bottling, by infected caps, or by unsterilized bottles.

Pasteurization should be encouraged, but carefully controlled. This is not an easy matter but recently devised methods give promise that this can soon be easily and quickly done.

Pasteurization should never be allowed for the purpose of "fixing up" or making saleable a poor or dirty milk. But milk from tuberculin tested, healthy, clean cows, gathered and handled in clean surroundings and properly pasteurized is the safest milk that has yet been produced.

4. HOME PASTEURIZATION.

In case the housewife can not find a milk which is certainly safe, then what shall she do?

Under such conditions the best thing to do is to get as good a milk as possible and pasteurize it in the home. This can be done without great difficulty.

If the milk is received in bottles pasteurize it in them, if not put it in bottles or fruit jars. Place them in a small pail or kettle with a false bottom made by inverting a pie tin in which a few holes have been punched. This will hold the bottles off the bottom, allow a circulation of the water, and prevent "bumping". Through the cap of one of the bottles a good thermometer should be passed. Cold water is then poured around the bottles as near to the top of the milk as possible. The pail or kettle should then be put on the stove or over the gas flame and heated slowly until the proper temperature is reached. This should not be lower than 145 degrees F. This temperature should be maintained for from 20 to 30 minutes. This can be done on the back of the stove or over a very low flame. The pail should be covered while it is standing with a towel.

After it has been heated for the proper length of time the milk should be cooled as rapidly as possible. To avoid breaking the bottles they should warm water for a few moments and then into cold water and finally in as cool an ice chest as possible. When put aside the bottle should be tightly capped or if this impossible it should have a cup or glass inverted over it. Pasteurized milk should be kept cool and used as promptly as possible since only the dangerous bacteria are killed and those left soon begin to grow slowly in the cold and faster as the milk is allowed to warm up.

It should be remembered that bacteria, harmless in themselves and in small numbers, are undesirable in large numbers.

If the milk is being pasteurized for a baby it should be placed in nursing bottles,—just enough in any one bottle for a feeding. For holding the necessary number of bottles a rack is best arranged, but otherwise the process can be carried out as described above. The milk should not be removed from the ice chest, until immediately before it is to be used. If the milk in a bottle is warmed but not used it should be thrown out.

DR. W. D. FROST,

Wisc. Agric. Coll.

THE CHILDREN'S HOMER.

II

The Adventures of Odysseus. 4

IN reply to the Phaeacian king's question, Odysseus said:

"I am Odysseus, son of Laertes. Men everywhere have heard of me and my great skill in council. Your noble bard, in telling you the tale of Troy, has told you my tale, too, up to the time when we sailed away, and set our course for home.

"We landed first at the land of the Cicons, and took their city, slaying the men, but sparing helpless women and children. We took much booty there, of wine and food and treasure, and I hope my men be satisfied, and leave that coast before our fortune changed. But they were too greedy, and before we got away, the Cicons had brought their kinsfolk, from farther inland, to their aid. These men were better fighters than the others, and they were more numerous than we. They drove us to our ships, but there we made a stand, and fought till night, losing many men.

(To be continued)

Write Us To-Day--

- - For a Copy of this Book of Bargains - -

1915 EATON'S ORDER NOW

SEMI-ANNUAL SALE

SUPPLEMENT TO SPRING & SUMMER CATALOGUE

A WONDERFUL ASSORTMENT OF

BARGAIN VALUES

For price and description of this Hat see page 15 (50-894)

You'll do well if you sit down right now and order some of these money-saving Specials. There's going to be a steady stream of orders from this book of bargain items, and we pass the word along ORDER EARLY AND OFTEN. You'll be wonderfully pleased with your purchase, because the goods have mostly been bought specially for this Sale, in big quantities and at low quotations, and prices have been pared low to keep everybody busy. Don't delay your order. Think of the saving you secure by buying during this Sale.

For price and description of this Hat see page 15 (50-896)

SALE ENDS AUG. 14TH

AN IMMENSE SAVING

WOMEN'S ALL-WOOL SERGE DRESS

Smart Style, and Very Serviceable

3.50

58-512. Specially low-priced is this Woman's All-Wool Serge Dress—and the quantity is limited—so our advice to you is order now. It is made in tunic style, with under-flounce on separate lining of black lawn. Smart standing collar is of fine black Poplin, and the front closing is finished with large self-covered buttons. Choice of Black, Navy or Copenhagen Blue. Bust sizes 34, 36, 38, 40, 42 or 44. Skirt length 40 inches with deep hem. Sale Price 3.50 And we pay the shipping charges.

A VERY EXCEPTIONAL BARGAIN

WOMEN'S PLAIN AND STRIPE VOILE DRESS

(with Tie and Belt)

1.98

58-803. Charming Summer Wash Dress for Women, made of Combination Plain and Stripe Voile, in the fashionable Jumper style. Dress has front closing trimmed with novelty black bone buttons and a neat silk tie, and is finished with black patent leather belt. The fashionable flare skirt is cut 2½ yards wide around the bottom. Colors Black or Copenhagen Blue stripe on White ground. Bust sizes 34, 36, 38, 40, 42 or 44. Skirt length 40 inches with deep hem. Sale Price 1.98 And we pay the shipping charges.

WE PAY THE SHIPPING CHARGES

- On Goods quoted on Pages 1-7
- On Heavy Goods quoted freight paid
- On orders of $10.00 and over of all merchandise advertised in this or any of our Catalogues

THE T. EATON CO. LIMITED TORONTO CANADA

THIS IS YOUR OPPORTUNITY TO SAVE

OUR SEMI-ANNUAL SALE CATALOGUE is, undoubtedly, the most welcome book you could find these days. It lists a multitude of just such articles as are in daily use, and in nearly every instance the prices are surprisingly low. The quality of goods offered during this Sale is of our usual high standard, representing, in many instances, fortunate purchases on our part of odd lines at big price concessions. In other ways also we have secured special price reductions on large orders so that workers might be kept busy during the quiet months. All in all, this is a very wonderful Sale opportunity for you, as the prices we quote will fully bear out. But there is also this note of warning—

REMEMBER THAT THIS SALE ENDS AUGUST 14th

This means that you have no time to waste if you desire to make the most of the occasion. If you have not received a copy of our Sale Catalogue (28 pages), see to it that you secure one without further delay. Such bargains as are now possible may not come your way for a long time to come. You'll be more than surprised at the great purchasing power your money has through the means of this Sale Catalogue. Send in your order now, and you'll order regularly. It's not presumptuous to say that the Sale will be only too short for those who make the most of it.

THE EATON GUARANTEE ALWAYS PROTECTS YOU.

THE T. EATON CO. LIMITED
TORONTO - CANADA

THE MORE REGULARLY YOU BUY THE MORE YOU SAVE.

The Ginseng Culture

A Ginseng garden is certainly the most profitable plot on a farm.

Few years ago, especially in 1909-1910, this paper gave information to the farmers of the province of Quebec about this culture. In the environs of Montreal, in the counties of Chateauguay, Laprairie, Napierville, a great many took advantage of the information given and are to-day making a profit on it; they now sell every year about 150, 200, 300 lbs. of Ginseng, from $6. to $8. a pound.

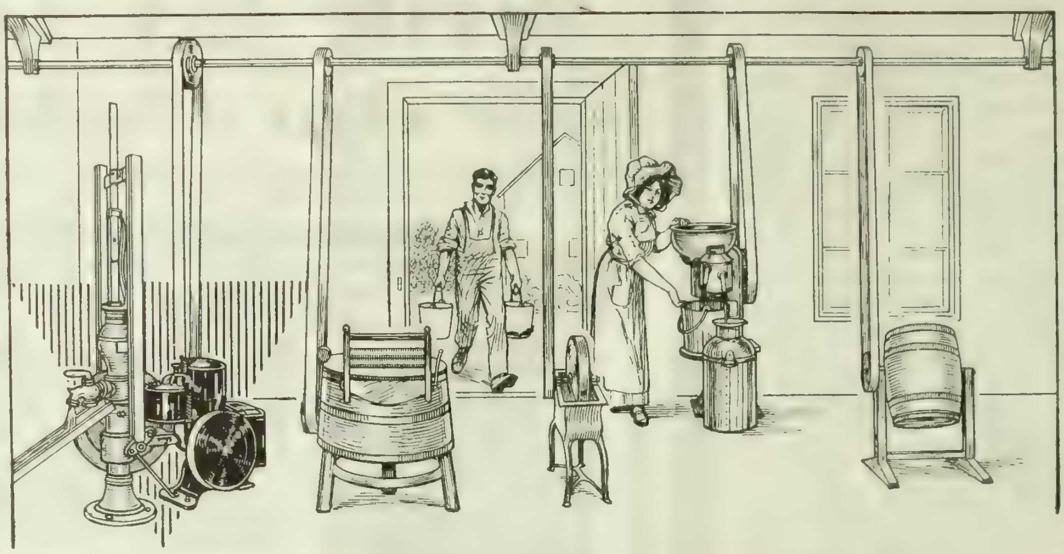
A square rod grows from 75 to 100 pounds of Ginseng; this proves that only a small piece of land is needed and that the profits are very encouraging; an acre of soil gives an incontestable and considerable profit.

Some ask themselves why this culture does not interest people in the lower part of this province? Do they believe that the climate is not favourable? No, because it is well know that the more the ginseng grows in the north, the more it contains medical properties and the more it is popular with consumers. These plants can grow in the same places as rhubarb and radish.

Just give them by means of a lath opening an artificial shade like the one they have according to nature (wild state).

J. A. HUBERDEAU

ST. REMI, CO. NAP.



The Farmer's Cheapest Power

The Fairbanks-Morse Eclipse Engine is positively the cheapest and most satisfactory engine built for producing power to run light machinery on the farm.

It will operate several machines at one time, as shown in the illustration, or any machine separately.

"MADE-IN-CANADA" and "GUARANTEED FOR LIFE."

The Eclipse is cheap in first cost, operation and maintenance—with ordinary care it will last a lifetime.

It is strong, light, easy to operate, absolutely reliable under the severest conditions and will save its costs many times each year.

Send for free book "Power on the Farm" and read what a practical farmer has to say about F-M Engines solving your help problem.

Eclipse No. 1, $48.

F.O.B. Torcnto Factory.

Complete with pump jack all ready to attach to your windmill pump.

"For the past year my "Eclipse" has been in constant use. You would not imagine what a labor saving piece of machinery it has proven to be on our farm. It costs so little to operate that we would not do without one for double the amount."
ROBT. YEATMAN, B.C.

The Canadian Fairbanks-Morse Co. Limited

Address: 14 Fairbanks-Morse Building, nearest branch.

ST. JOHN, QUEBEC, MONTREAL, OTTAWA, TORONTO, HAMILTON,
WINNIPEG, SASKATOON. CALGARY, EDMONTON, VANCOUVER, VICTORIA,

Canada's Departmental House for Mechanical Goods

Few products in household use to-day have bridged the gap from the primitive things of sixty years ago as has

Redpath Sugar

Canada's first refined sugar, "Ye Olde Sugar Loafe" of 1854, was REDPATH ; so was the first Canadian granulated sugar, in 1880, and the first Sugar Cartons in 1912.

The leader in every advance, Redpath Sugar stands to-day first in the estimation of tens of thousands of Canadian families. 131

Ask for "REDPATH" in Individual Packages.

2 and 5 lb. Cartons. 10, 20, 50 and 100 lb. Bags.

CANADA SUGAR REFINING CO., LIMITED, MONTREAL.

AUG 5 1915

The JOURNAL of AGRICULTURE
AND HORTICULTURE

Volume 19 August 1st 1915 Number 2

Delegates to the Second Annual Convention of the Quebec Homemakers' Clubs, held at Macdonald College, June 15-16th 1915.

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

King George's Navy Plug

Victorious all along the line !
KING GEORGE'S NAVY PLUG CHEWING TOBACCO

Taste the lingering flavor !

It's all due to our scientific blending of choice tobaccos, careful manufacturing and good Canadian workmanship. All the original flavor is retained.

A PRIME FAVORITE — TRY IT YOURSELF !

MADE IN CANADA

For Sale Everywhere - 10c a Plug.
THE ROCK CITY TOBACCO COMPANY, LIMITED,
MANUFACTURERS,
QUEBEC — CANADA.

Be Sure the Grocer Sends

Redpath

EXTRA GRANULATED SUGAR

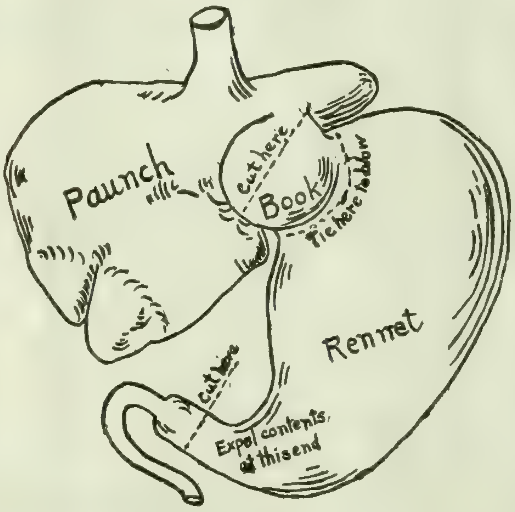
with the fruit you order for preserving.

Tell him, too, that you want it in the Packages originated for Redpath Sugar — 2 or 5 lb. Sealed Cartons or 10, 20, 50 or 100 lb. Cloth Bags.

Then you will be sure to get the GENUINE REDPATH—Canada's favorite sugar for three generations—the sugar to whose preserving purity you can safely trust good fruit.

CANADA SUGAR
REFINING CO.,
LIMITED,
MONTREAL.
135

WANTED-- CALF RENNETS



Owing to the war in Europe the supply of foreign rennets has been reduced and domestic rennets are in demand.

Farmers will find it profitable to save calf stomachs and Butchers and Commission Dealers can add a paying line to their business by collecting and shipping the cured pieces. We are in the market at all times for calf rennets either dried or salted and invite correspondence.

CHR. HANSEN'S LABORATORY, INC.
Little Falls, N. Y. U. S. A.
Manufacturers of

Chr. Hansen's Danish Rennet Extract, Danish Butter Color, and Danish Cheese Color. Lactic Ferment culture for ripening Cream in Butter Making and Milk in Cheese Making. Rennet Tablets and Cheese Color Tablets for Farm Cheese Making.

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE
AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 97,657
ENGLISH, 9,820
FRENCH, 87,837

Volume 19
AUGUST 1st 1915
Number 2

EDITORIAL

DANGEROUS TO ADULTERATE MAPLE PRODUCTS NOW

IN view of the possibility that the present high prices of maple sugar and syrup may tempt some to experiment in the adulteration of these materials, we think it well to call attention to the fact that at the last session of Parliament amendments to the Adulteration Act were adopted which make the penalties for adulterating or mislabling foods and for selling adulterated foods much heavier than they have hitherto been.

The minimum penalty for any of these offences is now twenty-five dollars and costs. The law also provides for a reward to anyone who has furnished information or otherwise aided in the collection of the penalty. These amendments should operate as effective deterrents to the criminally inclined.

The same act which makes these wholesome amendments to the Adulteration Act embraces a specific clause prohibiting the manufacture or sale of any imitation of maple syrup or sugar or any compound of maple syrup or sugar with other material. The use of the word "maple" on any but pure maple products is also prohibited. These provisions are even more drastic than those adopted last year.

It should also be borne in mind that improved methods of analyzing maple syrup and sugar are being developed, rendering the detection of adulteration easier than it has been in the past. Under present conditions honesty is not only the *best* but the only *safe* policy.

THE CATTLE OR WARBLE FLY

THE Cattle or Warble Fly is considered a serious summer pest by the dairymen of the Chateauguay-Huntingdon district. Its presence among the cattle throws them into a panic and the animals may be seen careering about the fields in a vain effort to get away from the intruder.

The opinion is very prevalent that this fly stings cattle, but close examination shows that such is not the case. Its sudden darts towards the animal represent so many efforts to deposit its eggs on the hairs of the legs. Anyone may without much trouble observe that its egg-laying apparatus is flexible and is not adapted for piercing, while the mouth-parts which form the stinging appliance of other flies are scarcely developed at all.

Another erroneous idea regarding this Cattle fly is that the eggs are laid on or under the skin of the backs of the cattle, since the lumps or "warbles" are located there. As a matter of fact the history of the fly is quite wonderful. The eggs attached to the front hairs are licked into the mouth of the animal where the maggot hatches; it moves into the gullet, bores through the wall, and gradually makes its way up through the muscles and other tissues to the skin of the back. There it makes a cyst or cell and continues to grow. About March and April this lump or warble is full grown and the maggot makes its escape to the ground where it remains as a pupa for four or five weeks. In June and July the adult bee-like winged flies emerge to bother the cattle, and to lay their eggs.

There appear to be two species of cattle or warble flies in Quebec. Specimens obtained near Howick differ from the common brownish-black bee-like forms in having orange bands across the body. This species is European and has no doubt been introduced on imported cattle.

As to a method of control, the simplest and most practicable is to set aside a "warble week" about the end of March every year when all owners of cattle will remove and destroy the maggots from the lumps on the backs of the cattle. If this procedure is conscientiously followed up by all the live stock men of a district there will be no Cattle or Warble Flies to trouble the cattle the following summer.

The method is worth trying—not only in improving the comfort of the cattle but also in preventing losses in the milk supply and in the damage to the hides.

THE GOVERNMENT PURE-BRED BULLS IN GOOD DEMAND

FOR the past two years the Live Stock Branch of the Dominion Department of Agriculture has been supplying bulls on loan to agricultural associations. The number of bulls so distributed in the first year was 414 and the number of applications for the season of 1915 was 502. Quebec and Saskatchewan are the provinces which have taken most advantage of this generous policy of the Dominion Department. In 1914 Saskatchewan took 127 bulls of which no less than 102 were shorthorns. In 1915 she applied for 126 shorthorns and 21 bulls of other breeds, making 147 in all.

A great many of the associations in Western Canada which have asked for Shorthorn bulls have specifically expressed their preference for animals from good milking strains. In Quebec also there has been a good demand for Shorthorn bulls, although that for Ayrshires has been greater and more Holsteins and Canadians have been asked for than in any other province.

Alberta and the Maritime provinces have also shown their appreciation of bulls of good type.

The number of bulls of each breed taken by Quebec in each year are as follows:—

	Bulls borrowed 1914.	Application made 1915.
Shorthorn..	42	54
Ayrshire..	49	76
Holstein	10	18
Canadian.	7	6
Hereford.	1	3
Jersey..	1	1
Total	110	158

It is to be hoped that our Farmers' Clubs will continue to make use of these bulls and that a decided improvement in the average stock of the province may result. There is no excuse for the immature scrub bull which one still sees running with the herd in too many of our Quebec fields.

THE BANKER-FARMER CONVENTION AT CHICAGO

A rather noteworthy event last month was the conference in Chicago of men prominently engaged in agriculture, banking and other professions in the United States and Canada.

The purpose of the Conference was to get a better understanding of the farmer's problems and to devise methods of helping him to obtain more satisfactory results from his labors. The significance of such a conference called by the American Bankers' Association must be evident to all who are trying to read the signs of the times. The question naturally arises: Why are not our Canadian bankers taking as much interest in agricultural matters? Several reasons might be given for the attitude of our bankers to the interests of agriculture, but in our judgment the main reason is: their best market for loans at the present time is the manufacturing industries. So long as agriculture is prosperous so long will the other industries which the banks are helping be prosperous. The Canadian bankers are not so wise as their American brethren in that they are looking at the immediate present while the latter are scanning the future and are making their plans accordingly.

Our bankers do not seem to see that the prosperity of the country depends largely upon the status of agriculture. Here is what Chairman Harris of the Bankers' Association said at the conference: "Whatever the problems, local or international, that we must solve in the near and unknown future, we will be the better prepared for them if we build up our agriculture and rural life, making the farm more livable as well as more profitable. Agriculture is not alone our financial stay, but a stalwart farming population is our best political and governmental bulwark—an anchor to windward."

Many instances of help by banks and bankers associations were given at the conference. One bank financed a large corn show at which $1,250 were given as prizes; another bank employs an agricultural expert who devotes his entire time to the promotion of the farm business; a third bank supports a county agricultural representative; a fourth bank conducts demonstration farms; a fifth publishes farm bulletins; and the Alabama Bankers' Association employs a woman agricultural expert among the rented farms of the state.

Some of the topics discussed were: The New Agriculture, What the Banker is doing to help Country Life, the Country Agent Movement, Prin-

CONTENTS

EDITORIAL.—Dangerous to adulterate Maple Products now.—The Cattle or Warble Fly.—The Government pure bred bulls in good demand.—The Banker Farmer Convention at Chicago.—Wanted, Business Leaders in Agriculture.—Committee of the Council of Agriculture visit Macdonald College.

ORCHARD AND GARDEN.—Box packing of Apples.—Fighting potato enemies. — Fire Blight and Hold-over canker of fruit trees.—Hiving the swarms.

FARM AND FARM CROPS.—Timothy seed situation.—Bulletin on the appearance of Quebec crops.—The Boys' Farm at Shawbridge.—Look out for Grasshoppers.—Seasonable Hints.—The Farm Water supply.—A study in Soil cultivation.—Quebec Provincial Exhibition 1915.—Excursion to Macdonald College.—A good time for killing weeds.—Diseases of the Potato. — Farm Weeds, continued.—The Hessian Fly. — Quebec Fairs 1915.

LIVE STOCK.—Live Stock Market's policy. — Co-operative marketing of wool.—The Howick Farmers' picnic.—Mamitis or Garget. — Hot-weather hints for the stockman.—Canadian Ayrshire record of performance test.—In-breeding.—Why not more sheep? Auction sale, registered live stock.—Repellents for protecting animals from the attacks of flies.

DAIRY.—Classification of cream. —The Quebec Cheesemakers' Agricultural Co-operative Society.—Cooling of Milk.—Clean milk.—Home care of Milk.

POULTRY.—Seasonable Poultry hints.—Shipping crates.—Summer care of pullets. — The value of Mineral elements in poultry feeding.

WOMAN'S WORLD.—Feeds and Food preparation, (continued). Canning young vegetables.

GENERAL INTEREST: — Meat in hot weather.—Protect buildings from lightning.—Beware of flies.—Weeds on vacant lots.—Deep fall plowing and the seed bed.—3he farm equipment.—Cottonseed rations that supply cheap and valuable protein and fat.—Oil-mixed concrete.—Leaders in Country communities.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

ciples and Profits in Soil Improvement, Rural credits, Rented farms, Rural schools, etc.

We hope to say more on this subject in later issues and to show how our agricultural industry might be greatly helped by the bankers of this country.

WANTED, BUSINESS LEADERS IN AGRICULTURE

AGRICULTURE is an applied science, but *farming* is something more. It is a *business* as well as a profession. To attain the highest success a farmer must understand and apply economic principles as well as scientific principles. He must not only know how to grow crops and stock but he must be able to decide what crops and what stock will give him the greatest profits and how to buy and sell to the best advantage. And inasmuch as it is impracticable for the great majority of practical farmers to go so deeply into the study of the basic principles of economics as to be able to apply them promptly to the varying conditions of life, sound leadership in economics is just as essential as sound leadership in scientific matters.

No intelligent man to-day questions the advantage to the community of having a few competent men engaged in scientific agricultural research. In Canada one has only to recall that Marquis wheat and O.A.C. No. 21 barley are the results of such specialists' labours to realise what a great blessing our experimental farms have been to the country. The policy of stationing local advisers—District Demonstrators as we call them in Quebec—about the country to give advice on scientific questions is also justifying itself in the eyes of intelligent men.

Now the economic principles which underlie the business side of farming are just as abstruse as the scientific principles underlying the arts of plant and animal production. In order to obtain the best reslt—to enable our farmers to realize the greatest profit from the least labour—we must have economic research as well as scientific research and we must have business leadership as well as scientific leadership. Some of our demonstrators, it is true, are attempting something in the way of business leadership, realizing with Sir Horace Plunkett that of Roosevelt's triple prescription for rural progress "better farming, better business and better living", the second item is usually quite as fundamentally important as the first. These demonstrators have realized the importance of co-operation in the buying and especially in the marketing of materials and have made it their business to organize the necessary societies for such co-operation.

But it must be remembered that these demonstrators have been trained rather in the science than in the business of agriculture. Our agricultural colleges have not provided the same facilities for the training of men in economics as they have for the training of men in the sciences. We believe the time will come when the agricultural college will turn out men specially trained in the economic aspects of agriculture, men who will be able to advise what lines of farming will be most profitable in a given locality, what size of farms are most economic for that locality, how the supply of labour and machinery can be most advantageously employed, how the products may be marketed to best advantage, when a change of policy in the matter of production is advisable, and so on. And when such men are available we believe every progressive agricultural community will be as eager for his services as it now is for the services of the man with scientific training. We shall then have two classes of local agricultural advisers — one devoting his attention to weeds, insects, soil correction, the use of fertilizers, the improvement of live stock and so on, the other advising on such economic questions as we have referred to above.

Let us have professors of rural economics in our agricultural colleges and courses so arranged that men can be adequately trained along these lines.

COMMITTEE OF THE COUNCIL OF AGRICULTURE VISIT MACDONALD COLLEGE

THE Committee on Agricultural Colleges of the Council of Agriculture paid their annual visit to Macdonald College on July 16th. The members of the committee were: Dr. Pilon, Chairman, A. Dawes, C. C. Descary, C. B. Carbonneau, J. Lafontaine, R. E. Skillen, C. Blouin and O. Lessard, Secretary of the Council.

In the absence of Principal Harrison, Professor Lochhead welcomed the members and accompanied them in their inspection of the various outside departments of the College. First, under the guidance of Professor Barton they were shown over the farm. A large field of 35 acres of silage corn was much admired, not only for its uniformity and growth but also for the fine cultivation and absence of weeds. The check-row system of planting was shown to be superior to the drill system as it permitted cultivation in many directions. Next a fine field of oats, barley and peas brought out the importance of sowing mixed grain both for green feed and for grain on account of the greater yield produced. Two other large fields of oats were remarkably uniform and gave promise of a very high yield.

The root-crops of mangels and swedes also looked well in spite of the set-back they received in June from cutworms. Professor Barton emphasised the importance of producing much *roughage* for cattle, and in this regard nothing surpassed roots and corn. It was better economy to produce such crops and to buy the necessary oil and meal cake.

The committee next visited the piggery where many fine sturdy litters of Tamworths, Berkshires and Yorkshires were observed in movable colony-houses.

The large herd of milch cows were out in pasture and contained representatives of four breeds—Ayrshires, Holsteins, Shorthorns and French-Canadians. Most of the animals were pure-bred, and several had very high milk records to their credit.

In the stables were seen pure-bred sires of each of the breeds—all show animals of their class. The Committee commented very favorably on the cleanliness of the stables and the excellent arrangements for handling the milk. It was observed that silage corn put up last october was fed to the cows when they returned from pasture.

Next, Professor Murray, head of the Cereal Husbandry Department, took charge of the party and guided them through a portion of the experimental grounds where many varieties of oats, barley and wheat were being tested with the object of obtaining the best for the province. Considerable attention—more than any other station—is being given to the production of improved strains of roots and root-seeds. The war in Europe was compelling Canada to grow her own root-seeds which she formerly secured from Germany.

Professor Murray showed the visitors some fine plots of alfalfa, and told them that successful growing of this crop in Quebec depended on (1) the planting of seed of hardy strains, (2) the proper preparation of the soil and freedom from weeds, and (3) the absence of acidity in the soil. He thought, moreover, that farmers could grow their own alfalfa seed and thereby secure better results.

Professor Bunting acted as guide through the large new orchards and small-fruits plantations. The trees are now coming into bearing and present a healthy, vigorous appearance. Time did not permit of close inspection of the numerous experiments under way with the object of determining the best methods of growing an orchard under Quebec conditions.

A short inspection was also made of the Poultry department where Mr. Jull explained the methods employed in hatching and rearing chicks, and the types of colony houses. The breeds most in evidence were Plymouth Rock, White Wyandotte and Rhode Island Red.

Miss Gray explained to the visitors the nature of the work done in the Home Dairy Department, the making of Coulommier and Cream cheeses, and the testing of milk, and the making of butter.

After luncheon in the small dining room of the College. Miss Fisher, head of the School of Household Science, escorted the party through the laboratories of the school under her charge, and explained clearly the nature of the instruction given the young women. Attention was drawn also to the part taken by her department in the recent movement for the formation of Homemakers' Clubs in this province.

Before departing Messrs Dawes and Blouin expressed their appreciation of the fine things they had seen during their visit, and of the courtesies extended by the college during the visit.

WAS HE REALLY STUPID ?

A young foreigner was being tried in court, and the questioning by the lawyers on the opposite side began.

"Now, Laszky, what do you do?"

"Ven?" asked Laszky.

"When you work, of course," said the lawyer.

"Vy, work——"

"I know," said the lawyer, "but what at?"

"At a bench."

"Oh!" groaned the lawyer. "Where do you work at a bench?"

"In a factory."

"What kind of a factory?"

"Brick."

"You make bricks?"

"No, de factory is made uv bricks."

"Now, Laszky, listen. What do you make in that factory?"

"Eight dollars a week."

"No, no! What does the factory make?"

"I dunno; a lot uv money, I think."

"Now, listen! What kind of goods does the factory produce?"

"Oh," said Laszky, "good goods."

"I know, but what kind of good goods?"

"The best."

"The best of what?"

"The best there is."

"Of what?"

"Of dose goods."

"Your Honor," said the lawyer, "I give up."—Current Opinion.

"Anyhow, there's one advantage in having a wooden leg," said the veteran. "What's that?" asked his friend. "You can hold your socks up with thumbtacks."—*Columbia Jester.*

THE GARDEN AND ORCHARD

BOX PACKING OF APPLES

THE box as a package for Quebec apples has not been adopted by many of the fruit growers as yet, but an increased interest is being taken in box apple packing and this year should see even a greater number of apples put into boxes than formerly.

With a comparatively light crop of apples everyone will be anxious to get the most out of his fruit and the box is one of the best aids to obtaining the top prices for good fruit. The box is not an expensive package and should cost but a trifle more than the barrel, reckoning on three and a half boxes equal to one barrel, and, of course, they are much more convenient to handle, not only from the grower's viewpoint, but also from the commission merchant's or the retail dealer's viewpoint. However, in using the box it is absolutely necessary, in order to obtain satisfaction, that only No. 1 apples of good varieties should be put in the boxes and all the apples in one box should be nearly equal in size and of the same color and general appearance.

Apple packing in boxes is a comparatively simple operation after one has given it a little study and practiced it a few times, and when one becomes proficient he should pack in boxes equally as fast as in barrels. Forty to fifty boxes a day should be obtained after a few days' experience.

Before commencing the packing of apples in boxes the beginner should obtain a copy of "Modern Methods of Packing Apples and Pears", by A. McNeil and a copy of "The Inspection and Sale Act" both of which can be obtained on application to the Fruit Branch, Dept. of Agriculture, Ottawa, Ont. These bulletins will give much information that will be invaluable to the beginner as well as to the expert.

The box should be made of good, strong, well-seasoned wood; with inside measurements ten inches in depth, eleven inches in width and twenty inches long; and with the following specifications: the end pieces ¾ inch thick and preferably of one piece, the side pieces ⅜ inch and the top and bottom ¼ inch thick. For the top, bottom or sides two pieces of wood may be used, but three pieces are not desirable The material should be dressed on both sides, as this adds very little to the cost and much to the general appearance. Cleats should be used for the top and bottom. These may be made of material ¼ inch by ½ inch or ⅝ inch. The nails should be a light 1¾ inch rosined nail, and four only should be used for each end of the top, bottom and sides.

As most apples packed in boxes are wrapped, it is necessary to pay some attention to wrapping paper. The paper must be light, thin and strong, and of a neat appearance. The size will vary according to the size of apples. The standard size, 10 x 10, will wrap all medium-sized apples. For large apples 12 x12 or 11 x 11 may be necessary, and for small apples, such as Fameuse, 9 x 9 is most satisfactory.

APPLE PACKING TABLE
(By P. J. Carey)

Type of Pack.		Apples in top tier.	Total No. in tier.	Actual Tiers.	Apples in box.	Position of Apples	Size of Apples.
Diag.	2-1	4-4	12	3	36	Side	Very Large 3 3-4
"	2-1	4-5	14	3	41	"	" "
"	2-1	5-5	15	3	45	"	" "
Str.	3	5	15	3	45	"	" "
"	3	6	18	3	54	"	Large 3 2-3
Diag.	2-2	3-4	14	4	56	End	" 3 1-2
"	2-2	4-4	16	4	64	"	" 3 1-4
"	2-2	4-5	18	4	72	"	" 3 1-4
"	2-2	5-5	20	4	80	"	" 3 1-8
"	2-2	5-6	22	4	88	"	" 3
"	2-2	6-6	24	4	96	Side	Medium to large
"	2-2	6-7	26	4	104	"	"
"	2-2	7-7	28	4	112	"	"
"	2-2	7-8	30	4	120	"	"

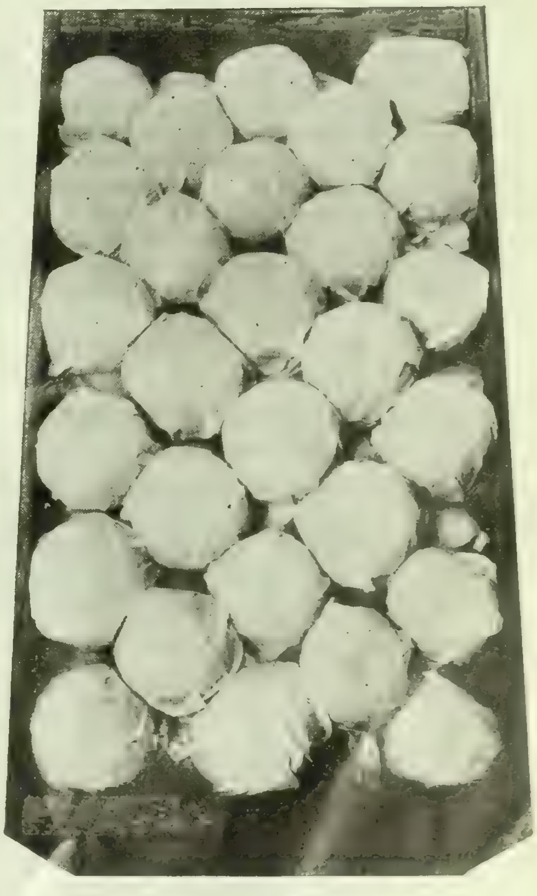


Fig. 3.—Fameuse apples.—A very common pack for medium size apples. Diag. 2-3, 5-6, 5 tier with 138 apples in the box.

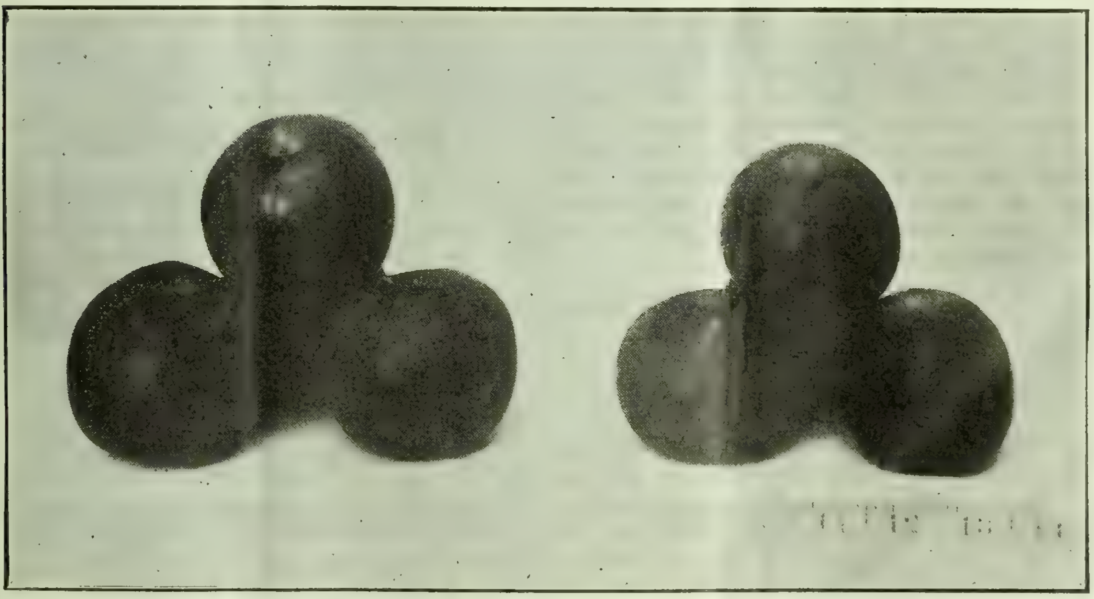


Fig. 1.—McIntosh and Fameuse apples.—Such apples as these should always be wrapped and packed in boxes when intended for shipment.

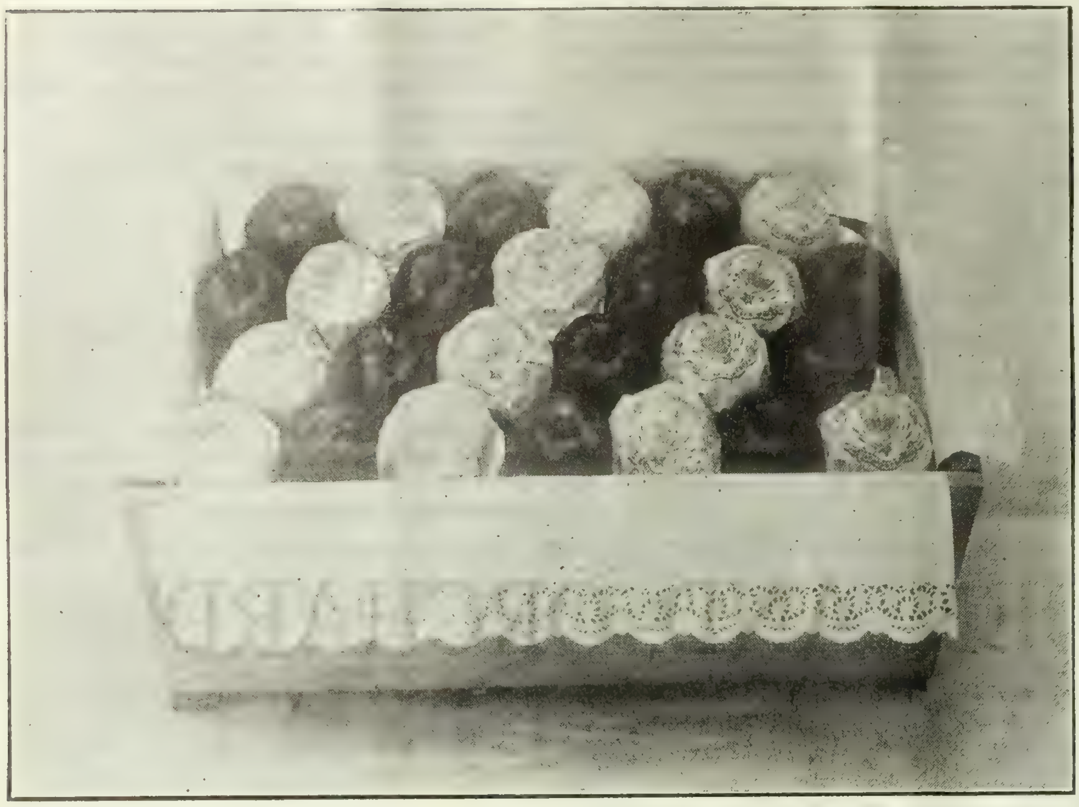


Fig. 2.—Prize box of McIntosh, Exhibited by the Oka Agricultural College, at the Pomological Society's exhibition at Macdonald College. Pack diag. 2-2,—6-7, 4 tier with 104 apples in the box.

"	2-2	8-8	32	4	128	"	Medium to large
"	2-3	4-5	23	5	113	End	Medium
"	2-3	5-5	25	5	125	"	"
"	2-3	5-6	28	5	138	"	"
"	2-3	6-6	30	5	150	"	"
"	2-3	6-7	33	5	163	"	Medium to small
"	2-3	7-7	35	5	175	Side	Small
"	2-3	7-8	38	5	188	"	"
"	2-3	8-8	40	5	200	"	Very Small
"	2-3	8-9	43	5	213	"	" "
"	2-3	9-9	45	5	225	"	Too Small

Any size apple may be packed according to one of the above packs.

The accompanying table is one used by Mr. P. J. Carey of the Dominion Department of Agriculture, in his packing demonstrations and is worthy of study for the beginner who must remember that it takes practice to make an expert apple packer.

In box packing careful grading as to size, color and freedom of blemishes, discarding all but No. 1 apples, the use of a neat well-made standard box, good wrapping paper, preferably with the grower's brand, and careful packing of the apples in the box, insuring a tight uniform pack with the proper bulge, will insure satisfaction to the buyer and a good price to the grower.

T. G. BUNTING

FIGHTING POTATO ENEMIES

Bugs and Blight

FOR *Late Blight and Beetles, Spray Every Two Weeks Until Harvest With*: 6 lbs. Blue Stone (Copper Sulphate) 4 lbs. Unslaked Lime, 12 oz. Paris Green, to 40 gallons of water.

Roguing the Field

SOME potato disease affect the seed potato in a way that will be obvious when looking at the outside of the tuber (Scab, Powdery Scab, Rhizoctonia, Dry Rot, etc.); others will become noticeable or cutting a tuber for seed (Late Blight, Brown Streak or Net Necrosis, Black Leg, etc.), but there are a number of diseases which cannot be eliminated by a careful selection of seed potatoes. The germ of these diseases, nevertheless, lies latent in the seed potato, and will either prevent th growing of the sets altogether or produce feeble, sickly-looking plants with rolled-up leaves and often bearing no potatoes underground.

Take up all such diseased hills,—never mind if you should find a few nice looking potatoes under such hills,—and burn them at once. This is known as "roguing" a field of potatoes. Go over each row, and throw out all "rogues."

Examples: Leaf Roll Disease, Mosaic Disease, Curly Dwarf Disease, etc.

H. T. GUSSOW, Ottawa

FIRE BLIGHT AND HOLD-OVER CANKERS OF FRUIT TREES

DURING the summer months is the time when much can be done to prevent "fire or pear-blight" from becoming serious. It costs little to remove all dead twigs or limbs in the summer, when they will show up well; and the doing of this prevents a lot of serious damage. Fire Blight, Black Rot and other fruit diseases will destroy twigs, and, if not removed in time, "hold-over cankers" will form on limbs or trunks, which you cannot remove without spoiling the tree. If you do not remove such dead twigs during the summer months, your trees will always go back, because you aid in the propagation of these diseases, and sooner or later you will have to remove the whole tree. Do a little work now and save the tree; but do it well. Take a knife or shears or saw, and sterilize them in a solution of 1 part of Perchloride of Mercury to 1,000 parts of water, and cut off the diseased twigs well below the diseased tissues. After using the implements, dip them into the disinfecting solution before making another cut. Burn all cut-off material without delay.

H. T. GUSSOW, Ottawa

HIVING THE SWARMS

WHEN the hives are well populated with bees and a steady honey flow is on the bees will begin swarming. The first swarm which is accompanied by the old queen is a fairly easy one to hive as a rule. The bees will generally light on the lower branches of a nearby tree where they can be easly cut down or shaken off into a swarming box, sometimes directly into the hive which is to receive them. If the hive is clean and is not located where it will get the benefit of a hot sun the bees will "stay put" and go ahead with building up. Sometimes it happens the bee-keeper will make use of an old hive which has had wax moths in it and which has not been thoroughly cleaned out or it may be that there is some strong objectionable odor present in the hive which the bees take a dislike to, in which case they may sometimes leave the hive and go back and cluster on a branch again. Occasionally, when the newly hived swarm is set in a warm location, and the inside of the hive gets very warm in consequence, they will leave their hive. As a rule a swarm which will stay in their new location for twenty-four hours after being hived will stay permanently.

About a week or ten days following the first swarm, if the honey flow and warm weather keep up, there will be a second swarm. This will be headed by a young queen which has hatched since the first swarm. These are sometimes inclined to be erratic in their actions. A first swarm will sometimes cluster on a branch for nearly a day before they start away to find a new location. A swarm headed by a queen only a few days old will sometimes cluster for only a few hours and occasionally will abscond without clustering anywhere. The latter case is exceptional however. In dealing with second swarms it is a good plan to hive them as soon as they have clustered, putting them in a fairly shady location and a clean hive. Besides this, it is a good practice to put in a frame of unsealed brood. Bees will rarely leave unsealed brood and in the case of these second swarms it will often keep them in their hive.

A third swarm will sometimes appear a day or so after the second, and the foregoing remarks applying to a second swarm will hold good for a third, also.

It will sometimes be noticed that the bees will swarm and then return to their hive, without clustering. As a rule this is a fault of the queen in not having followed the swarm, and they will come out again on the following day. Swarms which have been hived late in May or early June will build up strong and swarm in July or August. These late swarms will sometimes need to be fed a few pounds of sugar syrup in order to bring them safely through the winter.

It is a good plan to inspect the hives which have young queens in them about ten days or two weeks after they have swarmed or hatched out. Young queens should be laying within that length of time. If there are no eggs in any of the cells give the colony a frame of brood containing larvae and eggs and notice after a couple of days if they have begun to build queen cells. If so, they are queenless and a queen should be given them without much delay.

HARRY W. JONES,

Bedford, Que.

FERTILIZING MADE PLAIN

By John Gall, Inglewood, Ont.

IT would be worse than useless to give liquid manure to tender plants, such as young seedlings, or newly potted plants in which root action has made very little headway. Never use liquid manures when the soil is dry or parched. For example, if it be desired to stimulate the growth of sweet peas in dry, hot weather, it should be the rule to thoroughly soak them a day previous to that on which liquid manure is to be applied to the roots. This rule applies equally to greenhouse plants as to the stronger-growing plants outside.

Study the requirements of your plants which you desire to stimulate; give stronger doses to gross-feeding subjects than to weaker-growing plants, and, above all, stop the use of stimulants as soon as the highest stage of maturity is attained.—*Canadian Horticulturist.*

THE FARM AND FARM CROPS

TIMOTHY SEED SITUATION

PRESENT and prospective high prices for hay is having the natural effect in reducing the areas that may be left to timothy seed. Reports from the United States also indicate reduced areas left to this seed crop. Two-thirds of our supply is usually imported from the United States, where it is grown on land ranging in value from $75 to $150 per acre. This seed comes rather badly hulled but is particularly free from weed seeds.

The prospects for this year are considerably higher prices for timothy seed. Canadian farmers are advised to bear this situation in mind and arrange to leave for seed particularly clean pieces of timothy.

Seed Branch, Ottawa

BULLETIN ON THE APPEARANCE OF THE CROPS

In the Province of Quebec, 10 July 1915

Published by order of the Hon. J.-Ed. Caron, Minister of Agriculture of the Province of Quebec

THE present season commenced with an exceptionally mild month of April, at least in the first half, and the fall of rain and snow had created a good supply of water equal to about 2 inches in depth, throughout the Province.

The month of May, on the contrary, was mostly dry, but it was more particularly the cold weather which characterized it. It even snowed in many regions, and the number of days or rather of nights when it froze, was great enough to constitute a remarkable meteorological fact. The frosts occurred repeatedly in the following localities: at D'Israëli, for 17 days; at Ville-Marie, 12 days; at Lennoxville and Nicolet, 9 days; at Abitibi, Beauceville and Lake Megantic, 8 days. Montreal was the only place in the Province which was not subjected to the frost. In June, at Quebec, a central point which gives a fairly good idea of the meteorological conditions of the Province, the weather was fine and dry during the first two weeks; from the 12th to the 20th there were many showers; the end of the month was divided into bright sunny days, interspersed by welcome showers which gave an active impulse to vegetation of all kinds.

At Quebec, there were only 186 hours of sunshine in the month of May, while in June the observatory registered 226 hours of sunshine; but generally and until the end of June, the nights continued cold.

Generally, if the work of preparing the ground for seeding was done in proper time, the coming up of the grain and other crops, as well as the growing of the grass in the meadows and the pastures, was considerably retarded, a condition of backwardness which fortunately disappeared more and more under the happy influence of a warmer and moister temperature.

In a word, the appearance of the crops in the Province is good, even very good, and reaches at least 80 p.c. It reached about this figure last year, while it was only 79 p.c. in 1913, and only 77 p.c. in 1912.

The crops which this year have the best appearance, are firstly the potatoe crop (83 p.c.), oats and barley (82 p.c.), and afterwards wheat and almost all the other crops. Timothy hay remains in the general average (80 p.c.).

The tobacco and flax crops give the poorest showing (78 p.c.)

We were glad to see that our farmers have well understood the necessity of increasing the size of their fields of grain and particularly of wheat; in a certain number of counties the extent of ground sown in grain has increased by more than one-third, and in some parishes the increase has reached nearly 100 p.c.

HAD. NAGANT

THE BOYS' FARM AT SHAWBRIDGE

Raw Material—Bad Boys; Finished Product — Good Citizens. An Institution Worthy of More Generous Support

PICTURESQUELY situated in the beautiful valley of the North River, just outside the town of Shawbridge, in the shelter of a precipitous but wooded hill are the buildings of the Boys' Farm and Training School. This institution is one of inestimable benefit not merely to those whom it trains but also to the province, inasmuch as it is an effective means of converting potential criminals into really useful citizens, fitted for rural life. Is there, we wonder, another school in Canada with one-fourth of its graduates at the front to-day defending our Empire and our liberties? This little school, matriculation to which is obtained (except in rare instances) through the courts as a result of theft, vagrancy or other juvenile wrong-doing, has graduated some 98 boys in its six years of operation. Of these no less than 24 have enlisted, one has lost his life at Langemarck, one has been wounded and another is reported wounded and missing. Of the unenlisted graduates two are in the professions, 7 in mercantile life, 2 in railroad work, 14 in trades and 13 employed on farms or in gardens. All the 98 but some half dozen have been heard from during the past year, and in only two or three cases have the report been bad. What better evidence of the school's efficiency could be desired ?

Budding stockmen of the Boys' Farm, Shawbridge.

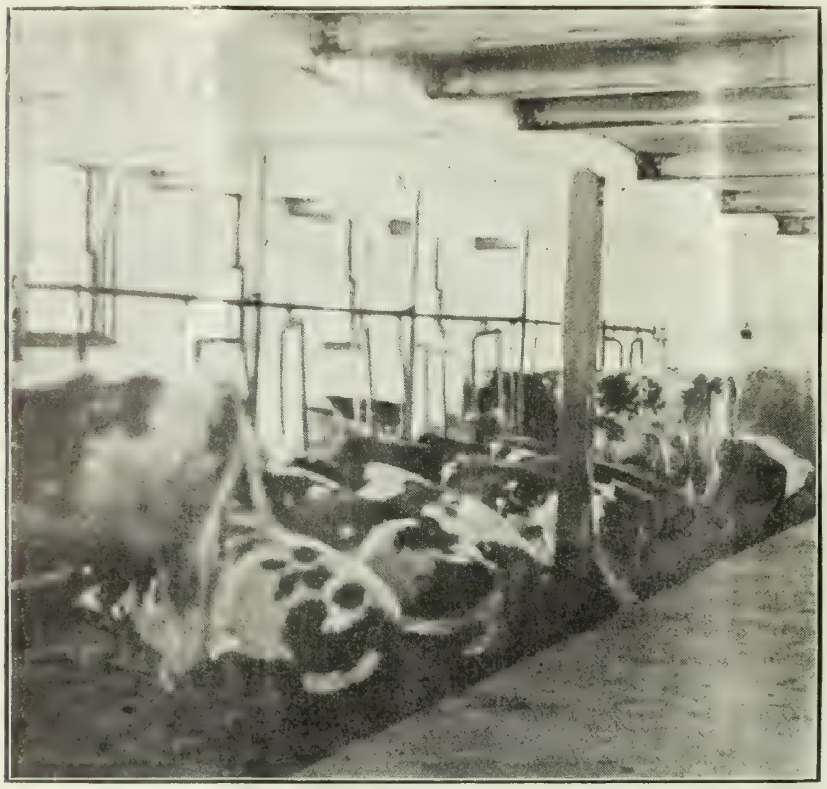
Employment of the boys in the School

The school is primarily a reform school, not a school of agriculture. Its principal purpose is the upbuilding of character and the farm training is only one of the means to this end. Boys who prefer to do so can have training in a trade—carpentry, tailoring, cooking or laundry—in place of the training on the farm. As a rule, the boys spend alternate days in the schoolroom and at work in the farm or shop. The report of the school for 1913 shows 35 boys working in the farm and gardens in the summer, 10 in the carpenter shop, 6 in the bakery, 4 with the tailor, and 15 in domestic work, while in the winter all these numbers were lessened and 43 boys were in school every day.

Reform Methods

The report of Dr. Gordon Mundie shows that a large proportion of the boys in the school are very backward mentally. What their moral character is when they enter is sufficiently indicated by the fact of their being committed to the school by the courts. What it is when they leave is clear from the records of the graduates as given above. Obviously a miracle of transformation is accomplished during their term of residence. The manner in which this miracle is wrought will to most readers appear no less marvellous than the fact that it is wrought. The Boy's Farm has none of the marks of a prison. There are no walls, no iron fences, no locked gates, no ball-and-chain attachment to the feet of any boy. Boys have run away from the school, but only rarely, and those who have run away have been recaptured through the efforts of their school-fellows. As a rule a Boys' Farm boy does not want to run away. Those who have gone have

Filling the Silo on the Boys' Farm.



Interior of Stable. Boys' Farm.

been either newcomers or boys who had been guilty of wrong-doing in the school and who were anticipating punishment. But why do not the boys care to run away? Because they are well-fed, kindly cared for and justly treated. These are no doubt the main reasons.

"That the boys are happy at the Farm is beyond any questioning", says the Rev. F. Elliott Baker, who spends one day of every week at the farm, "and judging from what they often tell me during our quiet and confidential talks, I know they would rather, by far, remain there than go back to their comfortless homes. I am convinced also that they realize, after a few months' residence, how great is the advantage to their lives of living at the farm for one or two years." This testimony of the Honorary Chaplain was confirmed by the boy in cadet uniform who conducted the Journal's representative about the farm, last June. "They do not whip us", he said, "they give us good food and plenty of it, the Superintendent and all the instructors are very kind to us. There is many a boy in Montreal who would be glad of such good food and so good a home."

Monitorial System

By enquiring more closely into the matter, one can learn some of the devices adopted by the genial and capable Superintendent, Mr. Geo. W. O. Matthews, to make the boys contented. In the first place, as our guide told us, good food is provided and every boy is allowed as much of it as he desires. Members of the staff are not allowed to punish boys by sending them from the table unsatisfied. There is a system of self-government which works something as follows: The Superintendent each year appoints a school captain and four monitors. When a boy is accused of any wrong-doing he is tried before a court of monitors. He has the right to select one of the monitors to act as his counsel and that monitor is bound to do all he can in the boy's behalf. There is a written constitution and it is the defending counsel's duty to see that all the constitutional rights of his client are respected. An appeal can be made from the decision of the court, the Superintendent acting as the Court of Appeal, which may modify or reverse the judgment of the monitors. It is seldom found necessary, however, for the Superintendent to alter the sentence of the monitors' court. It is the captain's duty to see that the sentence of the court is enforced.

The Boys' Fund

The writer stumbled upon another excellent feature of the government by enquiring the meaning of the term "Special Boys' Fund" which is found in the financial statement of the farm. Every month a small sum of money is set to the credit of this fund — 25 cents or so for each boy. When a boy leaves the school he is entitled to a share of this special fund. If a boy runs away, the expense of finding him and bringing him back is charged to this fund. It is, therefore, to every boy's interest to procure the return of the fugitive as promptly and economically as possible.

Material Equipment

The property of the Boys' Farm and Training School comprises about 275 acres and is valued at nearly $20,000. But the property includes the rocky cliff referred to in our opening sentence. This is of scenic value and is of importance as a source of wood and especially of water for the school. But it is, of course, inarable and the reader will no doubt be disappointed to learn that the cultivable farm and gardens are confined to about 60 acres. This is too small a farm for the purpose and it is to be hoped that in the near future means may be found to purchase more land in the valley.

The farm is run as a dairy farm, a four-year rotation of hoed crop, grain, hay and pasture being followed as closely as is consistent with the circumstances. Only a part of the land is suitable for corn and as about eight acres of this crop are required for ensilage and the amount of land sown to garden vegetables is necessarily larger than on a private farm, a strict adherence to the rotation is not practicable. In addition to the 60 acres under rotation, there are about 40 acres of permanent pasture.

Two years ago Messrs Robert Brodie and Peter Reid planted on the farm a provincial demonstration orchard of 200 trees.

Live Stock

The stock of the farm, valued at $3,400, comprises three horses, about 30 head of cattle and a few pigs. The average number of cows milked is 16. The cows are unregistered Ayrshires and grade Holsteins. Cow testing is practiced, the boys making the weighings and fat tests. Two of the cows have records of over 11,000 lbs of milk and several of over 10,000 lbs. The bull is an Ayrshire of good type.

Sixteen gallons of milk are shipped daily to the Ste-Agathe Sanitarium, the balance being used in the school itself. That the milk satisfies the Sanitarium authorities is sufficient evidence of the thorough training the boys receive at the hands of Mr. H. H. Scott, the farm instructor. The cows are groomed daily; flanks, quarters and udders are clipped periodically; and before each milking each cow is carefully wiped down. Each milker has two white milking jackets.

The produce of the farm for 1914 was valued at $3520, almost sufficient to meet the farm expenses, i. e. freight, feed, seeds, fertilizer, repairs and wages.

Farm Buildings

The present barn is the fourth upon the site, the school having been extremely unlucky in the matter of fires. It is 80 ft. by 36, with a side drive, a basement stable and a root cellar. The roof is of metal and the stable is covered with fireproof ceilling of concrete and steel. The stable accommodates 28 head not including the box stalls. Hay and bedding are supplied through chutes from the barn above, and roots are carried up from the cellar beneath the stable. Water is supplied to the cows individually. The manure is drawn out daily on a

General View of the Buildings of the Boys' Farm.—
Right foreground.—Cottage No. 1.
Right background.—The hill or cliff from which the farm draws its supplies of wood and water.
Left background.—Barns and Main Building (end view).

On parade, Boys' Farm, Shawbridge.

stone-boat or waggon. The milk room is in a separate building convenient to the stable. The horse stable and implement shed are also separate.

The silo, which is of concrete, has come unscathed through the three barn fires. It is 17 by 37 feet giving a capacity of 140 tons. Mr. Scott feeds turnips as well as silage. He reports that the silage freezes at the outer surface of the cement silo.

Water System

From beaver meadows on the high hill, a reservoir is fed, which in turn supplies tanks in the building at a head of 15 ft. This is the domestic supply for the residences and farm buildings. For fire protection this has recently been supplemented by a 50000 gallons cement tank on the hillside at a level of 200 feet above the buildings fed by a hydraulic ram in the overflow of the lower reservoir. A six-inch pipe from this high tank supplies four-inch hydrants at a pressure of 90 lbs, sufficient to throw a stream to a height of 140 feet. The school has 200 feet of the best rubber-lined fire hose and the boys are drilled in the use of the hose, as well as in that of chemical fire extinguishers, plaster hooks and axes and other fire-fighting apparatus.

Cadet Corps and Bugle Band

The boys of the school are organized as a Cadet Corps of the Canadian Militia. The Militia Department has provided them with a miniature rifle range equipment, comprising four miniature Ross rifles, target and ammunition. The drill instructor, Sergt. Akerman, has gone to the front, but the cadet corps continues its work under the other instructors. Mr. Jones, the carpenter, has trained a band of 6 bugles and 2 drums and one of the boys has taught the others Morse signalling.

Schoolroom

The schoolroom is commodious (providing accommodation for 80 boys), well lighted and furnished with substantial desks, blackboards and an organ. The school is conducted by Mr. R. S. Brignall, the Assistant Superintendent, a man in love with his work.

Dormitories

Thirty of the one hundred and five boys at present in the school are recommodated in the new residence, "Cottage No. 1", which is presided over by the tailor instructor, Mr. H. Connelly, and his wife. It is hoped eventually to house all the boys in cottages of this size. At present all of the remaining 75 are housed in the Main Building, the beds in the three dormitories being crowded as close as possible and in some instances double-decked. It is unfortunate that the financial resources of the school do not permit of the immediate erection of more cottages like the one recently built. The need of this additional living accommodation is keenly felt by all in touch with the school.

Financial support

The Provincial Government contributes 55 cents per day towards the support of each boy. This subsidy totalled a little over $17,000 last year while the expenses amounted to $27,600. The difference is met in part by the sale of produce and by the proceeds of the labour of the boys, but mainly through private subscriptions. We feel that this is just the kind of charity that should appeal to our readers. Subscriptions may be addressed to the Secretary, Mr. Elcho Ross-Ross, 189 St. James Street, or to the Hon. Treasurer, Mr. Charles S. J. Phillips, Montreal. Copies of the annual report may be obtained of Mr. Ross-Ross.

J. F. S.

LOOK OUT FOR GRASSHOPPERS

Apply the Poison-bran Mash

THERE are indications that grasshoppers or locusts will in all probability be a serious pest in many parts of Quebec this month. They breed in old pastures, and when they become numerous they migrate in search of food. Grain fields are likely to suffer as well as meadows and pastures.

As the Grasshopper becomes older it gets larger and devours more food. It is, therefore, advisable to begin treatment early. In the June issue of the Journal of Agriculture (p. 253) attention was called to Circular 5 of the Entomological Branch, Ottawa, entitled "The Control of Locusts in Eastern Canada," where a simple poison-bait treatment was described as effective. This bait is prepared as follows:—

Bran	20 pounds,
Paris green..	1 "
Molasses, ...	2 quarts,
Oranges or lemons..	3 fruits,
Water..	3½ gallons.

The bran and Paris green are mixed separately while dry; the juice of the oranges or lemons and the grated pulp and peeling put into the water; the molasses is dissolved in this mixture which is used to wet the poisoned bran by thorough stirring. This mash should be scattered broadcast thinly over the infested field early in the morning. The amount given in the formula should serve for 5 acres.

SEASONABLE HINTS

UNDER the auspices of the Dominion Experimental Farms a quarterly publication is being issued entitled "Seasonable Hints", to which the principal authorities at the Central Farm contribute. On the cover a map in outline is given with the location of the farms, stations and substations indicated by signs. Beneath the map is an invitation to all and sundry having agricultural problems they wish solved to send them to any of the principals at the Farms or Superintendents of the stations, the post office addresses of whom are given. Director Grisdale, of the Experimental Farms, says that the first number was so flatteringly received that he and his staff are encouraged to hope for even a better reception for this number. Mr. E. S. Archibald, Dominion Husbandman, deals with live stock; Mr. F. C. Elford, Dominion Poultry Husbandman, advises on the care and disposition of poultry; Mr. W. L. Graham, Field Husbandry Division, gives timely suggestions regarding the care and harvesting of fields crops; Dr. M. O. Malte, Dominion Agrostologist, talks on forage plants; Mr. H. T. Güssow, Dominion Botanist, throws light on the best treatment of potatoes, alfalfa, wheat, barley, fruit trees, to preserve their health; Mr. W. T. Macoun speaks of orchard cultivation, of cover crops, of spraying and of care of the potato plant; Mr. F. W. L. Sladen, Apiarist, gives practical counsel on bee culture and preparation for winter; Mr. F. Charlan, Dominion Tobacco Specialist, deals with matters whereof he knows relative to the growth and development of the Tobacco plant, and Dr. Frank T. Shutt, Dominion Chemist, briefly furnishes sage advice regarding the farm water supply. Mr. J. F. Watson, Chief Officer of the Extension and Publicity Division, enphasizes the invitation to the 760,000 occupiers of farm lands in the Dominion to address problems for solution to principals and superintendents. A copy of "Seasonable Hints", it should be added, can be had free on addressing the Publications Branch, Department of Agriculture, Ottawa.

THE FARM WATER SUPPLY

Location of the Well

AS the summer advances, the danger from the use of water from the shallow well increases and especially so if this well has been located in the barnyard or at no great distance from some similar source of contamination. Such wells draw their water from the immediate surroundings and if the soil is more or less saturated with organic filth, the water is inevitably polluted. With the hot weather, and more particularly after a spell of dry weather, the level of the water in these wells not infrequently is very materially lowered. This means a concentration of the manurial products in the water. Further, the high temperatures prevailing bring about an active decomposition of the organic matter, germ life flourishes and the water develops an offensive smell and probably becomes nauseating. These are sure indications that the water is polluted and unfit for domestic use.

Source of Danger

We strongly advocate the abandonment of the improperly placed shallow well, for at any time it may become a source of danger to the health of the farmer and his family. There is no more important and valuable asset on the farm than an ample supply of pure water. If there is not a natural, pure source available, the safest supply is the deep driven or drilled well so located as to be beyond the possibility of local contamination. It is in the late summer and autumn that outbreaks of typhoid, diarrhoea and other water-borne diseases more particularly occur and several of the causes therefor have been indicated. These are the months to carefully watch the water supply. If it becomes offensive to sight, smell or taste, you may be sure it is not safe for domestic use.

Boil the Water

Boiling all the water required for drinking purposes is a great safeguard, for it will kill any disease germs that may be present, *but it will not make the water a good one.* Half a small teaspoonful of hypochlorite (chloride of lime), rubbed up with a little water and well stirred into a barrel of the water is another precaution for the destruction of germ life, that is now-a-days advocated. But a water impure from the presence of excretal matter is not to be recommended, even when one or other of these precautions carefully carried out.

Free Analysis

If the farmer has any reason to doubt the wholesomeness of his supply he should have a sample analysed. By writing to the Division of Chemistry, Central Experimental Farm, Ottawa, he will receive a copy of the directions to be followed in the collection and shipment of the sample.

FRANK T. SHUTT,

Dominion Chemist, (Asst. Director.)

A STUDY IN SOIL CULTIVATION

AN exceptionally valuable Bulletin to those interested in soil culture is No. 83, "Field Husbandry: Summary of Results", issued by the Division of Field Husbandry of the Experimental Farms, and that can be had by application to the Publications Branch, Department of Agriculture, Ottawa. Reports are gven of work carried on at the central and branch farms and stations. The results of experiments in rotation of crops furnish information of great value. These experiments cover a period of eleven years and the results with advice founded thereupon are set forth in the Bulletin according to years. Following are a few of the benefits given as derived from adopting a judicious system of rotation:

1. The appearance of the farm is improved.
2. Every field receiving at regular intervals its fair share of manure and cultural treatment, the entire farm is in a condition to ensure a maximum yield.
3. Cost is lowered by the saving of time due to all the work of a kind being confined to one field.
4. Fewer fences are required.
5. Machinery can be more economically utilized.
6. More live stock can be kept, thus increasing the quantity of available manure.
7. Profits and yields are increased.
8. The farmer is not dependent upon a single crop.
9. Permits of a more even distribution of the season's labour.

Following details of the rotations that are outlined is a summary of the characteristics common to all:

1. Grain fields are always seeded down with clover, even though it be used only as a fertilizer.
2. Grass and clover seedings are heavy. Increased crops of hay and rare failures of a catch have justified them.
3. Hoed crops form a large proportion of every rotation. An attempt to farm a small area without a hoed crop was not successful. Weeds could not readily be kept in check.
4. No field is left in hay for more than two successive years. The records show that the second crop almost always costs more per ton than the first, and that succeeding crops are liable to be grown at a loss.
5. Barnyard manure is preferably applied frequently in comparatively small quantities, rather than at long intervals in large quantities.

Expenditure required and derivable profits are fully explained along with the values of commercial fertilizers and the relative virtues of deep and shallow ploughing. Due regard to weather conditions and to the different varieties of soil make the Bulletin of national importance and one worthy of close study and wide inquiry.

QUEBEC PROVINCIAL EXHIBITION, 1915

August 28 to September 4

THIS is the fifth consecutive year!

The hands of time already indicate that the Quebec Provincial Exhibition has passed over the period of inexperience, and is now entirely convinced of its own vitality, and foresees all the best results that can be obtained from a firmly established enterprise; the success of past years give confidence for the future.

The aim of the Quebec Provincial Exhibition is to make the Province of Quebec more prosperous, richer and larger and it will endeavor to spend the best of its efforts for the success of agriculture as it is an ascertained fact that agriculture is the strongest base for all serious developments in a country.

Quebec, political capital, is already and will try to become more and more the agricultural capital of this Province. Any other city may claim any other title, but there is no doubt that these two belong to Quebec. For instance, the love of agriculture has become very popular since a few years, and this is due specially to the encouragement given to it by the Quebec Provincial Exhibition.

All those who have taken part in some way in the Quebec Provincial Exhibition, know of all the efforts displayed by the directors of the Exhibition to satisfy every exhibitor, and what generous premiums they have granted to those who have had the laudable ambition joined to the noble boldness of exhibiting their products.

The year 1915, as well as the Quebec Provincial Exhibition of 1915, will indicate a more energetic, a more complete and a more powerful endeavor towards the agricultural industry. In looking through this Premium List, one can be convinced, not only of the fact that the Quebec Provincial Exhibition does not want to fail in its reputation and in this year's motto, that is to say "The Year of Agricultural Boosting", but will understand the whole truth of the satisfaction expressed by a great number of exhibitors at Quebec in 1914 when saying:

"No doubt, this is the finest Exhibition of the Province, and it will soon be one of the finest of the whole Dominion. Quebec makes good at all times, and all the farmers of the Province who are interested in the exhibition rejoice."

Georges Morisset,

Secretary of the Commission of
the Quebec Provincial Exhibition

EXCURSION TO MACDONALD COLLEGE

The Sherbrooke and Richmond County Agricultural Societies visit the College, June 29th. A good attendance

ABOUT 150 persons visited Macdonald College in the excursion under the patronage of the Sherbrooke and Richmond County Agricultural Societies. The party was in general charge of Geo. J. Alexander, of Richmond, with Messrs W. G. MacDougall, L. C. McOuat, Demonstrators, and T. F. Ritchie, Assistant Superintendent of Experimental Farm, Lennoxville, as organizers. The day was fine and warm, so that it was possible for the visitors to inspect both the out-door and the indoor departments, and to carry out the following programme prepared by the College authorities.

For all, on arrival:—

1. Assembly Hall, address by Principal Harrison.

2. Lunch on the campus to the east of the Women's Residence.

3. All departments open, including poultry department, dairy, greenhouses, laboratories, students' residences, etc.

For the Women:—

1.00-2.00 p.m. — Demonstration in Soft-Cheese Making in the Home Dairy Department, by Miss Jessie D. Gray.

2.00-3.00 p.m. — Inspection of Poultry Department, under the guidance of Mr. M. A. Jull.

3.00 p.m.—Demonstration in the School of Household Science in Cooking for the Sick, by Mrs. Rutter, Room 101, Main Building, followed by an inspection of the School of Household Science.

Miss Campbell, Macdonald College demonstrator to Quebec Homemakers' Clubs to conduct the ladies of the party throughout the above programme.

For the men:—

1.00-3.00 p.m.—Inspection of the Horticulture department orchards, vegetable gardens, etc. Professor Bunting in charge.

1.00-3.00 p.m. — Inspection of the Live Stock stables and the Main Farm. Professor Barton in charge.

3.00-4.00 p.m.—Inspection of Cereal Husbandry plots, starting from the stables. Professor Murray in charge.

4.00 p.m.—Gasoline Engine demonstration in Machinery Hall. Mr. G. E. Emberley in charge.

Besides the persons already mentioned several prominent farmers were observed in the excursion party, among whom were J. H. Parker, Lennoxville and Mr. Waters of Kingsbury. Several teachers, former students of the College, were also present, visiting the old haunts and reviving memories of student days.

Altogether the day was spent most profitably and pleasantly.

The Excursion party from the Sherbrooke and Richmond Agricultural Societies—After lunch on the College lawn.

A GOOD TIME FOR KILLING WEEDS

THE hot, dry days of the summer are best for killing weeds, especially those which have persistent underground root-stalks and are perennial by nature. As soon as the early crops of hay, barley and rye are removed, operations should be started which will lead to the eradication of such weeds as wild oats, mustard, quackgrass and thistles. After cutting the grain crops, it is a good plan to disk the land so as to cover the seeds that have shattered out. This is especially useful treatment for land infested with wild oats. The disking is for the purpose of hastening germination. Two or three weeks after disking, the land may be plowed at the ordinary depth and harrowed and disked frequently. Hay land can be plowed soon after the crop is removed, and if Canada thistles or quack-grass are present their growth will be seriously interrupted. Following the plowing of the stubble or hay land, it becomes essential to double-disk the land once or twice per week, depending on the growth made by weeds, so as to prevent them from establishing new root systems. The disking should be kept up until about the 1st of September. It is difficult to give time for such operation during the busy haying and harvesting season, but anyone who has a patch of thistles or quack-grass that he wishes to eradicate can make much more progress during the hot weather of July and August than at any other season of the year. The effort should be made to find time if possible. The frequent disking and cultivation, to September 1st, will keep the quack-grass or thistles in subjection. By September 10th to 15th, the field may be sown to rye. The rye grows quickly and strong, and will take possession of the land, crowding back and choking the weeds during the fall season. The rye starts early in the spring also, before most weeds, and keeps them in check during the early part of the next year. Such treatment, persistently followed will lead to comparatively clean fields in a very short time. Those who are following regular crop rotation, and who are providing such crops as barley, rye and clover, that will permit plowing and cultivation during the hot season, are experiencing very little difficulty in completely cleaning their fields of the noxious weeds.

DISEASES OF THE POTATO

THERE could hardly be a more timely or a more practically valuable publication at this moment than Circular No. 9 of the Division of Botany at the Experimental Farm, Ottawa, dealing with "The Control of Potato Diseases", by H. T. Güssow, the Dominion Botanist. With the contents of this circular every grower of the "solanum tuberosum" would profit by acquainting himself. It tells of the different diseases to which the potato is subject and of the preventives and remedies that can be successfully applied. Especially does it deal with seed potatoes, a series of precautions being given that should always be taken before sowing. Instruction is also furnished on methods that should be adopted to redeem infected land, on the early recognition of disease, on spraying for the suppression of the Colorado beetle and Late Blight, and on the storing of seed potatoes. How to use bi-chloride of mercury and in what quantity is explained. Stable manure should not be used for potatoes is the sound advice given, as it may engender a scabby crop, which can be averted by the use of fertilizers. When there is a lack of humus in the soil, an application of crumbled peat will be found beneficial. This will also retain moisture in light soils. Information is given on the preparation and use of Bordeaux mixture. The Circular, which can be had by application to the Publications Branch, Department of Agriculture, Ottawa, should have a wide circulation.

FARM WEEDS

Article VII

The Eradication of Special Weeds

(Continued)

(k.) DANDELION

THIS common plant is not a weed of cultivated fields, but is a most persistent weed of lawns, pastures, meadows and roadsides. It spreads by seeds which are produced in heads and blown by the wind. Its roots are thick and fleshy and penetrate deeply into the ground, enabling the plants to withstand drought better than the common grasses. It is easy to find dandelion roots that are ten to fifteen years old. Unlike many other tap-rooted plants it is not killed by cutting below the crown, as new shoots are sent up from the roots. Besides, its bitter milky juices are distasteful to browsing animals, and it is allowed to grow unmolested in pastures.

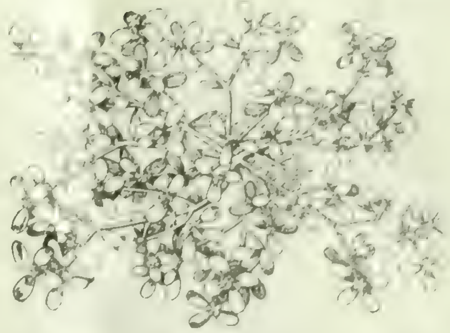
Dandelion and its seed, a deep rooted perennial.

The control of dandelions is difficult, but the persistent use of the spud and the destruction of leaf-growth will in time subdue them if seeds are not blown in. Attempts have been made in recent years to control it by spraying the field or lawn with iron sulphate (80 lbs. to 40 gallons of water). Success has been attained when the plants are sprayed frequently and after cutting or mowing. The spray kills the young seedlings and the opening buds of older plants.

(l) RAGWEED

Ragweed is an annual, common in meadows and pastures, but more readily observed in grain fields after harvest. As it propagates entirely by seeds, after-harvest cultivation will destroy most of the weeds and prevent them seeding. When the plants are allowed to go to seed and the land is plowed the seeds may remain dormant in the soil for several years. If grain crops are infested spraying with iron or copper sulphate will kill the young ragweeds. Infested clover fields should be cut early to prevent the ragweeds from forming seed. It is stated that the pollen causes "hay-fever."

Pigweed or Red Root is a common annual weed which produces shining black seeds abundantly.



Purslane, a common annual in gardens.

(m.) LAMB'S QUARTERS AND PIGWEED

These weeds are annuals and are common in gardens, waste places and cultivated fields. Their seeds are common impurities in grain, grass seed and clovers; they are readily recognised by their flattish, black appearance. They are able to live in the soil in a dormant condition for several years.

Hoed and root crops will destroy most of the lamb's quarters and pigweeds, provided good cultivation is given late into the season. In young grain fields a stroke of the harrow or the weeder will destroy most of the seedling weeds. After-harvest cultivation will also prevent the late plants from forming seeds.

(n.) CHICKWEEDS

There are several kinds of chickweeds, one being annual (Common Chickweed) and two being perennial (Mouse-ear Chickweeds). They are all very persistent and hard to eradicate. When present in gardens hand-weeding and hoeing will keep them from forming seeds, but in grain-fields they may be destroyed while young by spraying with iron or copper sulphate.

(o.) WILD OATS

This plant is an annual weed, is common in the West and is spreading to the East. The seeds may be distinguished from those of the common oat by the strongly-twisted, right-angled awn, by the brownish bristles at the base and surrounding the scar, by the slanting horse-shaped scar, and by the roughness and abundance of the raddish-brown hairs covering the kernel.

To eradicate wild oats, the land should be worked as soon as the crop is taken off and the weed seeds encouraged to germinate. The next season the field is given over to a hoed crop, and in the following year the land should be sown with grain without plowing and seeded down to grass. If allowed to remain in sod for three or four years most of the seeds of wild oats will be unable to sprout. Hand-pulling and burning wild oats is recommended, of course, if the field is newly infested and the plants are not too abundant.

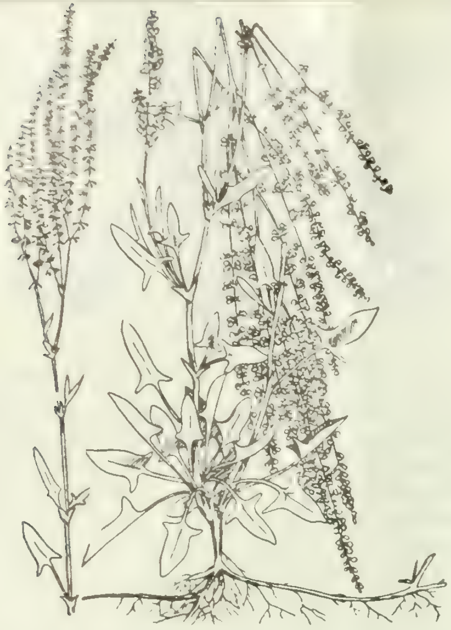
Another important factor is the *sowing of clean seed*. This is a case of the wise saying: "The dearest seed is the cheapest in the long run."

(p.) BLUE WEED OR VIPER'S BUGLOSS

This plant is often called "Blue Devil". It is a prickly biennial with a wand of bright blue flowers, and is becoming common in some localities along roadsides and in pastures and meadows. It can be easily destroyed by spudding before the seeds are ripe, or better during the first year of the plant's growth, whenever the large rosettes of

(t.) WHITE-TOP or DAISY FLEABANE

Meadows are often infested with this weed,



Sheep-sorrel, a creeping perennial in acid soil.

leaves are detected. A single plowing of infested land would destroy most of the plants.

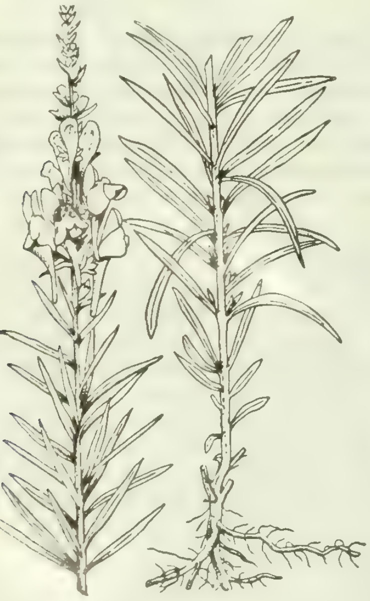
(q.) PURSLANE

Purslane is a very common annual weed in gardens and is readily recognised by its fleshy smooth leaves and stem which lie prostate on the ground. It produces an enormous number of minute black kidney-shaped seeds from July until frost comes. These retain their vitality in the soil for several years, and may, therefore, be a source of great annoyance for some time after the plants have disappeared. In the control of Purslane frequent surface cultivation and hoeing and raking to kill the young seedlings are recommended.

(r.) SHEEP SORREL

This perennial occurs on dry sandy land and is an indicator of sour soils. It propagates by rootstocks and by seeds which are frequently found in commercial clovers.

To eradicate sheep-sorrel it is necessary first to correct the acid condition of the soil by adding lime, then to enrich by manures or fertilizers. After-harvest cultivation is quite effective, and when reseeding is done to do so heavily with clovers and grasses.



Toad Flax or Butter-and-Eggs.

(s.) TOAD FLAX or BUTTER-AND-EGGS

Toad Flax is a common weed along roadsides and in pastures in some parts of Quebec. It is a perennial and it propagates both by seeds and by root-stocks. When meadows and pastures become badly infested they should be plowed in July, cultivated until Autumn and planted with a hoed or root crop the following season. In general this weed can be controlled by deep thorough cultivation in fall and spring and by a short rotation.

which produces seeds throughout the summer.

When a field is but slightly infested, hand-pulling early in the season is a good practice. After haying sheep should be turned in to graze upon the tufted leaves.

Badly infested fields should be plowed up, sown to grain and reseeded.

A closely related farm, the *Canada Fleabane* or Horseweed is also found in meadows.

The writer of this series of articles is deeply indebted to the Seed Division, Ottawa, for the use of the excellent illustrations of the weeds discussed.

W. L.

QUEBEC FAIRS, 1915

List of Fairs to be held under the auspices of the Agricultural Societies

County	*Townships*	*Dates*	*Secretary*	*Address.*
ARGENTEUIL,	Lachute,	Sept. 8-9-10,	G. J. Walker,	Lachute.
ARTHABASKA,	Victoriaville,	Sept. 21,	C. R. Garneau,	Arthabaska.
BAGOT,	St. Liboire,		L. A. Brunelle,	St. Liboire,
BEAUCE, DIV. A,	Beauceville,	Sept. 30,	Jos. Bernard,	Beauceville,
BEAUCE, DIV. B,	Lambton,	Sept. 14,	Pierre Fortier,	Lambton.
BEAUHARNOIS,	St. Louis de Gonzague,	Sept. 22,	W. Martin,	St. Louis de Gonzague.
BERTHIER,	Berthierville,	Sept. 23,	G. Allard,	Berthierville.
BONAVENTURE, DIV. A,	New Carlisle,		C. M. Kempffer,	New Carlisle.
BROME,	Brome,	From Aug. 31 to Sept.2,	G. F. Hall,	Brome.
CHAMBLY,	St. Bruno,	Sept. 22,	Ad. Benoit,	St. Bruno.
CHAMPLAIN,			D. T. Trudel,	St. Genevieve.
CHATEAUGUAY,	St. Martine,	Sept. 7,	N. Mallette,	St. Martine.
COMPTON, No. 2,			N. G. Scott,	Scotstown.
DRUMMOND,	L'Avenir,	Sept. 21,	J. C. St-Amant,	L'Avenir.
GASPE, DIV. A,			J. J. H. Balleine,	Cape Cove.
HOCHELAGA,			J. A. O'Gleman,	90 St. James, Montreal.
HUNTINGDON, DIV. A,			W. F. Stephen,	Huntingdon.
HUNTINGDON, DIV. B,			R. Ellerton,	Hemmingford.
IBERVILLE,	St. Alexander,	Sept. 7-8,	E. S. Lalanne,	Mount Johnson.
JACQUES-CARTIER,	Strathmore,	Aug. 23,	J. S. A. Ashby,	15 Ave. Lachine.
JOLIETTE, DIV. A,	Joliette,	Sept. 14,	J. O. Guilbault,	Joliette.
JOLIETTE, DIV. B,	St. Jean de Matha,	Sept. 9,	J. O. Léveillé,	St. Jean de Matha.
LAPRAIRIE,	Laprairie,	Sept. 14,	Art. Matte,	St. Constant.
L'ASSOMPTION,	L'Assomption,	Aug. 24,	I. J. A. Marsan,	L'Assomption.
LAVAL,	St. Rose,	Sept. 8,	Jos. Gagnon,	St. Rose.
MASKINONGE,	Louiseville,	Sept. 21,	C. Caron,	Louiseville.
MEGANTIC, DIV. A,			J. B. Campbell,	Campbell's Corner.
MEGANTIC, DIV. B,	Plessisville,	Sept. 14,	J. B. Vallée,	Plessisville.
MISSISQUOI,	Bedford,	From Aug. 31 to Sept.2,	C. O. Jones,	Bedford.
MONTCALM,	St. Julienne,	Sept. 21,	J. F. Daniel,	St. Esprit.
MONTMAGNY,	St. Thomas,	Sept. 16,	Alex. Proulx,	Montmagny.
MONTMORENCY, DIV. A,	Riv.-aux-Chiens,	Sept. 30,	J. Cloutier,	Riv.-aux-Chiens.
MONTMORENCY, DIV. B,	St. Famille,	Sept. 21,	E. Létourneau,	St. Famille.
NAPIERVILLE,	St. Remi,	Sept. 9,	Art. Collette,	St. Remi.
NICOLET,	St. Gregoire,	Sept. 7,	N. Levasseur,	St. Angele.
PONTIAC, DIV. A,	Shawville,	Sept. 8-9-10,	R. W. Hodgins,	Shawville.
PONTIAC, DIV. B,	Chapeau,		P. McMahon,	Chapeau.
PORTNEUF, DIV. B,	St. Casimir,	Sept. 8,	J. P. Guertin,	St. Thuribe.
QUEBEC,			J. B. Delage,	54, Bridge St., Que.
RICHELIEU,	St. Victoire,	Sept. 21,	Jos. Desjardins,	St. Victoire.
RICHMOND,	Richmond,	Sept. 16-17,	A. E. Main,	Upper-Melbourne.
RIMOUSKI,	Rimouski,		Zénon Berube,	St. Donat.
ROUVILLE,	Rougemont,	Sept. 21,	A. Ares,	Rougemont.
SHEFFORD,	Waterloo,	Sept. 14-15,	N. O. Rockwell,	Waterloo.
SOULANGES,	Pont Chateau,	Sept. 16,	G. R. Vernier,	Coteau Landing.
STANSTEAD,	Ayer's Cliff,	From Aug. 31 to Sept.2,	H. G. Curtis,	Stanstead.
ST. HYACINTHE,	St. Hyacinthe,	Sept. 13,	R. Morin,	St. Hyacinthe.
ST. JOHN,	St. John,	Sept. 9,	J. A. Lussier,	St. John,
ST. MAURICE,	St. Barnabé,	Sept, 21,	E. Bellemare,	St. Barnabé.
THREE RIVERS,	Banlieue Three-Rivers,	Sept. 28,	M. Pothier,	Three-Rivers.
TWO MOUNTAINS,	St. Scholastique,	Sept. 20 to 23,	J. Fortier,	St. Scholastique.
VAUDREUIL,	St. Lazare,	Sept. 21,	Jos. Denis,	Vaudreuil.
VERCHERES,	St. Theodosie,	Sept. 16,	J. E. Messier,	Varennes.
WOLFE, No. 1,	Marbleton,		E. J. Westman	Marbleton.
WOLFE, No. 2,	Ham, Nord,	Sept. 14,	E. O'Bready,	Wotton.
WRIGHT,	Aylmer,		R. K. Edey,	Aylmer, box 114.

PROVINCIAL EXHIBITIONS:—

VALLEYFIELD.—August 16 to August 21.
THREE-RIVERS.—August 23 to 28, C. D. Hébert, Three-Rivers.
QUEBEC.—August 28 to Sept. 4, Geo. Morisset, (City Hall).
SHERBROOKE.—Sept. 6 to 11, H. B. Miller, (Sherbrooke).

OSCAR LESSARD,
Secretary of the Council of Agriculture, Quebec.

THE HESSIAN FLY

A special circular recently issued by the United States Department of Agriculture reports that the Hessian Fly has inflicted immense damage during the past season to the wheat crop throughout an area which, in the north east, includes the States of Illinois, Indiana, Ohio and Pennslyvania. "The loss to the 1915 wheat crop", the circular states, "will undoubtedly amount to millions of bushels".

It is not unlikely that some damage from the Hessian Fly will occur in certain sections of south-western Ontario and this notice is published with a view to drawing the attention of farmers to this fact in order that outbreaks of this pest may be reported and that steps may be taken to protect the wheat sown in September and October. *No wheat should be sown in August.*

From late June until late September the Hessian Fly is usually in the "flax-seed" (that is the pupal) state. The larvae of the first or summer generation were responsible for this season's damage. These larvae transformed into the present "flax-seed" stage. From the "flax-seeds" the adult flies will emerge in August and September, according to latitude. This second generation attacks and passes the winter in volunteer wheat and in all wheat sown before the disappearance of the adult flies, that is, before the fly-free period. In western Ontario the fly-free dates would be approximately as follows: For the counties Essex, Kent and Lambton—Sept 15-20; between these and south of a line through Goderich, Berlin, Hamilton and St. Catherines—Sept. 20; between this line and a line through Owen Sound, Peterboro and Belleville—Sept. 15; north of this line and the Ottawa River—Sept. 10. After these dates wheat may be sown to avoid Hessian Fly injury as much as possible. The dates are only approximate and local conditions may affect the occurrence of the insect.

Where Hessian Fly injury has been experienced the following recommendations should be followed as far as is possible:

1. Destroy by burning the screenings and waste from threshing an infested crop, also burn the damaged straw and, if possible, the stubble. If it is impossible to burn over the stubble disk it thoroughly immediatly after harvest.
2. Do not sow wheat on stubble, if it can be avoided. Plough deeply the stubble of all infested crops before August 15, whether burned or disked, and roll the ground, to prevent emergence of flies from buried "flax-seeds".
3. Destroy volunteer wheat by harrowing, disking or by pasturing.
4. Before sowing made a good compact seed bed by disking, harrowing and rolling. This is most important especially if seeding has been postponed to escape the fly.

The Dominion Entomologist, Department of Agriculture, Ottawa, will be pleased to hear from farmers who have experienced Hessian Fly damage this season and to examine suspected plants. All communications and samples up to 11 ounces in weight so addressed may be mailed "free", and the assistance of the Entomological Branch is at the service of every Canadian Farmer.

7 July, 1915.

LIVE STOCK

A LIVE STOCK MARKETS POLICY

FOLLOWING the announcement which recently appeared in the press, announcing that the Honourable Mr. Burrell had initiated a comprehensive markets propaganda in the Live Stock Branch of his Department, an explanation respecting the details of that policy will be of interest. The scheme involves:—

1. The Organization of an Intelligence System which shall provide for:—

(a) *Statistics of Animal Population and of Production.*

Co-operation with the Census Branch of the Department of Trade and Commerce and with the Provincial Departments of Agriculture in the collection and analysis of statistics of animal population. Gathering current data as to the exact situation in the country respecting breeding and feeding operations, the supply of feed, the condition of stock, when heavy marketing may be expected, the districts from which the largest supplies may be available and the districts in which a shortage exists.

(b) *Information regarding the Home Market.*

The collection of definite and reliable information regarding market demand in the several provinces of the Dominion, with particular reference to current prices in the leading market centres and to conditions governing interprovincial trade in meats and other live stock products.

(c) *Information regarding the Foreign Market.*

Through agents of the Branch, through the foreign service of the Department of Trade and Commerce and from such other sources as are available, the gathering of adequate statistics and data to make possible an intelligent interpretation of trade conditions in foreign countries, exporting and importing, with the view of assisting our live stock interests to develop foreign trade, to adjust their operations to the requirement of foreign demand and to take advantage of such outlets as may from time to time appear for the profitable sale of live stock products.

(d) *Distributing Information to the Producers.*

The dissemination of this information to the producers in such an effective way that they may be able intelligently to anticipate market demands, to seize opportune periods for the profitable disposal of their stock, to adjust successfully their operations to the trade situation as developed by local and foreign requirements and to equalize production in the several provinces, thus providing against the alternate gluts and shortages which have in the past invariably tended to upset trade balances and defeat the expectations of the breeders.

2. The Organization of Farmers for Co-operative Action in the Sale of:—

(a) *Their Eggs and Poultry.*

The successful demonstration given in Prince Edward Island of the co-operative sale of eggs suggests the need and wisdom of extending the system now in operation to all the provinces of Canada and of its further elaboration as required by varying local conditions and in the development of interprovincial and foreign trade.

(b) *Their Wool.*

The policy to be pursued in this work must closely adhere to the principles followed during the past year but it is hoped that means may be devised which shall secure to the growers the commercial advantages of deferred sale when the market warrants the holding of the product.

(c) *Their Lambs, Hogs and Cattle.*

It is proposed to initiate the co-operative sale of live stock in accordance with the principles followed in the work already undertaken.

Note.—It should be made clear that in the prosecution of this programme it is not expected or intended to involve the Department in any commercial obligation, the farmers' associations, as a matter of deliberate policy, assuming full and complete responsibility in the transaction of their own business and, ultimately, in the executive administration of their own organization.

3. The Promotion of Sale by Grade and Payment according to Quality.

It is widely recognized that the sale of produce on a flat rate basis, for example in the case of hogs, invariably inflicts a penalty on the progressive farmer and in effect provides a premium for low grade goods. Evidence is not wanting that a well directed effort by the Department would favourably influence buyers and merchants toward an acceptance of standards and the rating of prices on a basis of market merit. It is the experience of the Branch that a movement in this direction is fundamental to any advance which may be made in improving quality and in increasing production.

4. The Co-operation of all Interests in the Development of our Live Stock Trade.

Under a Markets Policy, the Department may usefully endeavor to have itself recognized as a medium for the adjustment of differences between the producer, on the one hand, and the packing, transportation and financial interests, on the other, and an organization through which co-operation may be effected by these great industrial bodies in building up Canada's agriculutral trade.

The Markets Policy of the Live Stock Branch, operated in accordance with the foregoing outline, will be administered under the immediate direction of Mr. H.S. Arkell, Asst. Live Stock Commissioner. The present organization of the Branch will be made use of to the fullest extent, the work being carried on through the Chiefs of the several divisions, the cattle, sheep and swine, and poultry propaganda failing to the charge respectively of Mr. R.S. Hamer, Mr. T.R. Arkell and Mr. W. A. Brown.

CO-OPERATIVE MARKETING OF WOOL

Report on work undertaken by Macdonald College

IN the extension work of the Animal Husbandry Department of Macdonald College the sheep industry of the province is being made a prominent feature. It is believed that the possibilities for sheep in Quebec are great and that there is a splendid opportunity and urgent need for work on behalf of the sheep interests. Through the assistance of the Federal Grant the Department has been able to arrange and conduct a number of lines of work one of which has been the organization of local Sheep Breeders and Wool Growers' Associations. Through these, much greater interest is being stimulated in sheep, and flock improvement is being encouraged in every way possible. Some of the more important channels of effort are in encouraging and facilitating the exchange and introduction of pure bred rams, in establishing pure bred and high grade flocks, in marketing of lambs, and in marketing of wool.

Mr. A. MacMillan, a member of the Animal Husbandry Department, has been placed in immediate charge of the sheep work, and through his efforts and those of the local College Demonstrator, Mr. King, the first association was organized in Pontiac County, and as reported previously a start was made in marketing wool co-operatively last year. The association marketed about twelve thousand pounds of wool. The wool was graded and sold direct to manufacturers for cash, at an advance of from five to seven cents a pound or a net gain of 20 to 30% to the farmers.

During the past winter plans were made to organize a number of associations so that this year might see a start of similar work made in various parts of the province. It might be mentioned here that to insure that such associations be organized successfully and the wool marketed through them to advantage, a great deal of thorough preliminary work is necessary. In this the local College Demonstrator or Representative has a good field for work but he must have had first hand knowledge of sheep and a little experience in wool preparation for market before he can undertake this work and command the respect of sheep men.

With the assistance of Macdonald Demonstrators a large number of lectures and demonstrations in the proper methods of shearing, tying fleeces, docking and castrating lambs, etc., were given in the various districts. As many farmers as possible were induced to join the associations and be supplied with wool sacks together with instructions for preparing their wool for market.

Associations were formed in eight districts and arrangements made for grading and marketing wool on definite dates at certain important points within the districts.

The following is a statement showing the various grades for the districts and the total quantities of wool marketed together with returns made.

Weights of Wool

Association.	Lbs. Fine medium combing.	Lbs. medium combing.	Lbs. Low medium combing.	Lbs. Lustre combing.	Lbs. Black and Gray.	Lbs. Rejections.	Lbs. other grades.
Pontiac	277	25.138	11.531	2.436	660	709	2.906
Compton,	100	5.362	4.330	2.663	105	289	
Stanstead,	163	6.834	1.629	1.031	85	194	
Richmond,	72	3.776	1.931	3.489	180	435	147
District of Beauharnois,		1.763	2.338½	3.525	199½	469	306
District of Bedford,		2.337	1.588	2.460	60	257	
Argenteuil,		3.445	1.362	1.364	126	75	
Sherbrooke,	146	3.221	1.817	605	23	233	
Totals:	758	51.876	26.526	17.573	1.438½	2.661	3.359

Total pounds of wool marketed 104.192
Total Value.. .. ..$31.689.20

STATEMENT

Number of Members and Fleeces

Association	No. of members.	No. of fleeces.	Av. weight per fleece.	Av. price per fleece.	Total amount received for wool.	Av. price per lbs wool.
Pontiac,	413	6182	7.06	$2.15	$13,348.30	30.57c.
Compton,	150	1806	7.1	2.15	3,890.27	30.27 "
Stanstead,	83	1222	8.1	2.50	3,060.90	30.80 "
Richmond,	75	1360	7.33	2.23	3,022.07	30.12 "
District of Beauharnois,	79	1029	8.3	2.48	2,549.23	29.63 "
District of Bedford,	55	815	8.1	2.46	2,045.65	30.52 "
Argenteuil,	67	910	7.0	2.13	1,938.01	30.63 "
Sherbrooke,	53	812	7.4lbs.	2.26	1,834.77	30.35 "
Totals:	975	14,136	7.37	$2.29	$31,689.20	30.36 "

The results show that 51% of the wool graded medium combing, 27% low medium combing, 17% lustre combing, 3% black and gray and 2.6% rejections. The low percentage of rejections and high percentage of medium combing is a clear indication of the value of Quebec wool when properly prepared for market. The wool was marketed in good condition unwashed, put up in attractive shape and was described by manufacturers as being of high quality, probably unequalled in Cananada and quite the equal of similar grades of imported wool. This fact is substantiated by the prices manufacturers were willing to pay for such wool when marketed in quantities to make it worth their special attention.

Medium Combing realized 31 to 31¾ cts. per pound.
Low Medium Combing 30 cts. per pound.
Lustre Combing 30 cts. per pound.
Black and Gray 25 to 26 cts.
Rejections 25 cts. per pound.
All F.O.B. point of shipment.

The above prices range from five to ten cents above the prevailing local prices, thereby netting the farmers an advance of from 20 to 30%. The fleeces ranged in weight from 7.0 lbs. average in one association to 8.3 lbs. for another association, and prices per fleece ranged from $2.13 to $2.50. It will be noted in the report that in the case of Pontiac Association, the only one of two years' standing, the increase in wool marketed as compared with the first year's output was over three hundred and sixty per cent.

Canadian manufacturers paid these prices to the associations when they were buying wool ordinarily at much lower prices, partly because the associations had a large quantity of wool to sell at certain points where it could be inspected, partly because the manufacturers needed it and had to pay for it to get it, but also because they were getting wool well put up, and good value for their money.

H. BARTON

THE HOWICK FARMERS' PICNIC

A large attendance at the annual Dominion Day Picnic at Greig's Grove, Cairnside

THE Editor of the "Journal of Agriculture" was honored with an invitation to the Cairnside picnic, which has been held annually for nearly forty years on the farm of W. Greig, Esq. No other outing of the year is so well attended by young and old, affording as it does a relaxation between hoeing and haying. The attendance was upwards of 2,000 and the weather was everything that could be desired. The Ormstown brass band provided music for the occasion.

After enjoying the excellent lunch provided by the ladies the gathering was called together to hear the speakers of the day, by William Greig, Esq., who presided with his usual grace and ability. Two rather unusual features were noted in connection with the speaking event this year—the majority of the speakers were clergymen, and the chief topic discussed by them was the Duty of Canadians in the present War. The following clergymen addressed the gathering:—

Mr. D. T. Ness, the Secretary of the Picnic Committee.

Rev. R. L. Ballantyne, Maisonneuve;
Rev. A. E. Matthews;
Rev. R.C.H. Sinclair, St. Louis de Gonzague;
Rev. A. C. Ascah;
Rev. D. N. Coburn;
Rev. S. A. Woods, Riverfield.

In addition, Robert Sellar, Editor of the "Gleaner", gave a very clear talk on the reasons—commercial, patriotic and moral—why Canadians should help the allies. James Morris, M.P. for Chateauguay, congratulated the Chairman on the splendid gathering and spoke cheering words. Prof. W. Lochhead of Macdonald College spoke of the necessity of a proper education for the young men of the farms inasmuch as agriculture is a most intricate and complex profession and demands great intelligence. He also pointed out the need for more instruction in Home Economics for the young women of the farms if they were to fill their place in the community. Women have a community life as well as a home life.

Mr. Robert Brodie was happy in his reminiscent remarks of former visits to Chateauguay. Mr. Robert Ness spoke on behalf of the farmers and the great work they were doing in feeding the people in this crisis.

At Cairnside Picnic, Greig's Grove, July 1st 1915.—The men who have stood by the Annual Picnic for nearly 40 years:
Back row: — Rev. D. N. Coburn, D. McDonald, Marshall, Campbell.
Second row:—Messrs J. Gilbert, Rev. S. A. Woods, R. Donaldson, James Bryson.
Front row:—Messrs G. Nussey, R. Sellar, T. Reid, R. Ness, Snr., W. Greig, W. Moore, W. W. Bryson.

A group of ladies at the Cairnside picnic on Dominion Day.
Back row: Mrs. D. T. Ness, Mrs. R. R. Ness, Mrs. Geddes, Mrs. Carmichael, Mrs. Hastie, Mrs. Ritchie.
Front row:—Mrs. R. Anderson, Mrs. Wm. Kerr, Mrs. W. Greig, Mrs. R. Ness Snr., Mrs. R. McKell, Mrs. M. McKell, Mrs. Moore.

Mr. M. A. Jull of Macdonald College made a few remarks regarding the importance of co-operation in agricultural work.

During the proceedings the young ladies collected $94.51 in aid of the Patriotic Fund.

While the older people were listening to the speakers the young people were contesting a good list of sports.

Taking it all in all, the Picnic was one of the most successful ever held in the Grove, and the Executive Committee, with Mr. D. T. Ness as Secretary-Treasurer, deserves every praise for the excellent manner in which the proceedings were carried to satisfactory conclusion.

Picnics such as the one at Cairnside are most valuable events in any community; they tend to bring about a spirit of co-operation and *esprit de corps* and cause the hard workers to forget work for a few hours by mingling with their neighbors as comrades. Picnics represent bright spots in the lives of many people, and there should be more of them.

MAMMITIS OR GARGET

Troublesome Inflammation of the Udder of Cows — Infectious and Noninfectious Forms — Treatment Recommended

MAMMITIS, or inflammation of the udder of cows, commonly termed "garget," is frequently a costly and annoying trouble for dairymen. This is owing to the temporary, or in some cases permanent, loss of milk and consequent depreciation in value of affected milch cows, and to the time and attention necessary for treatment of the disease.

Mammitis is commonly observed in two forms, first, as an apparently noninfectious inflammation of the udder, traceable to a bruise or other injury, or to a sudden functional activity of the udder as observed frequently in heavy milkers and in heifers at the first calving; and second, as an inflammatory condition in which there is a tendency to suppuration and breaking down of the glandular tissues of the udder. The latter form is due to the presence of germs, which gain entrance into the udder and are conveyed from animal to animal through the medium of the milker's hands, by lashing the soiled tail, or by coming in contact with the contaminated floor or bedding. In these cases the udder, as well as the hands of the milker, should be washed before and after milking in a 2 per cent solution of compound solution of cresol (U. S. P.) The first form is usually confined to one cow in the herd, whereas, owing to the infectious character of the second form, it is commonly found affecting several animals.

Milk from an animal with this disease should not be used, and an effort should be made to prevent strippings or any of the discharge from the teats of the affected udder from falling upon the floor or bedding. Any bedding contaminated in this manner should be burned and the floor beneath the cow thoroughly washed with a solution of compound solution of cresol, as recommended above. In fact, every effort should be made to prevent continued reinfection of an affected cow or the spread of the disease from animal to animal throughout the stable. With this end in view it will be advisable, whenever possible, to place all affected animals in a building apart from that occupied by the rest of the herd and to disinfect thoroughly the stable from which they have been removed.

Suggestions concerning methods of disinfection will be found in Farmers' Bulletin 480, which may be obtained from the United States Department of Agriculture, Washington, D. C.

In the infectious form of mammitis the outcome is not always favorable, whereas in the noninfectious form the inflammation usually yields readily to treatment. In both forms it is generally advisable to give the animal a purgative dose of Epsom salts (1 pound or 1½ pounds) and follow with a limited ration of succulent, easily digested feed. The udder should be bathed with hot water for half an hour twice daily, and after bathing may be rubbed thoroughly with warm olive oil containing 3 per cent of gum camphor.

Owing to difficulty in milking cows with an inflamed udder, many dairymen are inclined in these cases to insert a milking tube into the teat duct. This is a practice which is to be discouraged except in certain extreme cases, but should it be deemed necessary to draw milk in this manner the tube, udder, and teats, and the hands of the operator should be thoroughly cleaned and disinfected by washing in a solution of the cresol compound previously recommended, both before inserting the tube and again when the drawing of milk is completed. Especial care as to disinfection should be employed after handling an infected cow before going to another animal.

HOT WEATHER HINTS FOR THE STOCKMAN

HORSES.—Feed the work horses well during the hard work of summer and fall. A grain mixture of oats, 5 parts, and bran, 1 part, gives excellent satisfaction. When feeding well, don't forget the usual weekly laxative, such as the Saturday night bran mashes, or the Sunday pastures.

Keep the colt growing rapidly, but not too fat:—the growthy, trim colt weaned on grass, grain and milk makes the largest and most valuable horse.

If the mares were not bred in the spring, why not try fall breeding? Fall foals are often fully as economical as spring foals, and you have the mares unimpaired for heavy spring and summer work.

Dairy Cattle.—When pastures are short, feed the dairy cows liberally but judiciously on green feed and grain;—one bag of meal fed before the cow declines in milk flow is worth four bags in trying to increase the milk flow after a decline.

The careful use of any good fly-repellent saves many pounds of milk and much torture to the cow. During the intense heat of summer, keep the cows in during the day if the pasture is without sufficient shelter.

Conserve the green feed for supplementing pasture:—if not sufficient for this year, prepare early for next summer.

Calves never thrive when subject to intense heat and flies;—house them comfortably during the summer day and increase the gains by many pounds.

Beef Cattle.—The scarcity of beef warrants the most economical use of pasture; pasture supplements,—such as green feed,—and even a limited grain ration in summer and fall feeding. Finish the steers early and thoroughly. Feed yearlings well;—these are usually neglected and much money lost.

Sheep.—Sheep were never more profitable than now. The summer and early fall are splendid seasons either to increase the flock or to make a start in the sheep business.

Farm Buildings.—If you have no silo or not sufficient silo room, it is not too late to build. Farm roughages were never so valuable as at the present.

E. S. ARCHIBALD,

Dominion Animal Husbandman

THE VIEW ECONOMIC

Recently a woman paid her fist visit to the ocean, and, as she stood on the beach, gazing at the great expanse of water, a friend happened along.

"They tell me, Mrs. Jones," said the friend, "that you never saw the ocean before. Is that true?"

"Yes," answered Mrs. Jones. "Most of my life has been spent in the middle west, you know."

"Think of the wonderful treat you had!" eagerly exclaimed the other "How did it impress you?"

"Well," thoughtfully answered Mrs. Jones, "when I looked at the amount of water they have down around here it struck me that fish might be a little cheaper."

REPORT OF CANADIAN RECORD OF PERFORMANCE TEST

During May and June, 1915

MATURE

NAME OF COW.	OWNER,	Lbs. Milk	Lbs. Fat	% Fat	No. Days
Daisy of Ferndale, 26735,	W. C. Tully, Athelstan, Que.	14032.	544.	3.88	340
Lassie of Highlands, 21491,	W. C. Tully, Athelstan, Que.	12340.	490.	3.97	346
Elsie of Winton Hill, 23711,	David Pringle, Huntingdon, Que.	12214.	454.	3.71	365
Betsy of Lakeside, 26687,	Geo. H. Montgomery, Philipsburg, Que.	11921.	448.	3.76	364
Ardyne Pomona, 30836,	Geo. H. Montgomery, Philipsburg, Que.	10370.	387.	3.73	365
Rose of Bonnie Brae, 26460,	G. D. Mode, Vankleek Hill, Ont.	9636.	347.	3.60	349
Lochfergus Jenny, 33282,	R. S. Pringle, Huntingdon, Que.	9464.	349.	3.68	309
Cedars Duchess, 20849,	John H. Deeks, Dunbar, Ont.	8891.	334.	3.75	315
Bossy, 35895,	Bert R. Brown, Little York, P. E. I.,	8684.	421.	4.85	350
Lady of Elm Grove, 31888,	H. K. Denyes, Holloway, Ont.,	8530.	310.	3.63	279
	FOUR YEAR OLD CLASS				
Queen of Springbank, 31378,	H. C. Hamill, Box Grove, Ont.	8971.	354.	3.94	275
Princess, 35896,	Bert R. Brown, Little York. P. E. I.,	8612.	312.	3.62	300
Annie of Elm Grove, 31185,	H. K. Denyes, Holloway, Ont.	8527.	315.	3.69	286
	TTHREE YEAR OLD CLASS				
Hazel of Bonnie Brae, 30676,	G. D. Mode, Vankleek Hill, Ont.	13014.	475.	3.72	291
Violet of Kelso, 33903,	D. A. MacFarlane, Kelso, Que.	10863.	400.	3.67	356
Flora of Willow Bank, 33463,	Chas. F. Hyde, Huntingdon,	10477.	393.	3.75	324
Queen of Fernbrook, 35467,	Collier Bros., Beachville, Ont.	9564.	440.	4.59	365
Burnside Bonnie Nancy, 33715,	Andrew Stark, Huntingdon, Que.	8042.	323.	4.01	311
Scottie's White Rose, 35127,	T. C. Treverton, R.R. N. 1, Latta, Ont.,	8038.	290.	3.60	351
Minnie Verbelle, 33847,	Percy Caverley Holloway, Ont.	8304.	346.	4.16	324
Blossie's Beauty, 31732,	Wilson McPherson & Sons, St. Ann's, Ont.	7792.	332.	4.26	364
Lady Betty of Lakeside, 30815,	Geo. H. Montgomery, Philipsburg, Que.,	7768.	297.	3.81	315
Nancy, 31066,	Wm. Hutchings, Sr., Haliburton, Ont.,	7733.	290.	3.75	350
Scottie's Star's Sarah, 34567,	John McKee, Norwich, Ont.,	7319.	275.	3.78	365
Duchess of Cedar Hedge, 32539,	John H. Deeks, Dunbar, Ont.,	7315.	269.	3.66	313
Lakeside Caprice, 32707,	Geo. H. Montgomery, Philipsburg, Que.,	7171.	305.	4.25	299
	TWO YEAR OLD CLASS				
Mary Campbell, 35078,	David A. Ashworth, R.R. No. 2, Denfield, Ont.,	8151.	303.	3.76	365
Rosette, 39614,	J. L. Stansell, Straffordville, Ont.,	7336.	316.	4.30	310
Marjorie of City View, 38602,	James Begg & Son, R.R. No. 1, St. Thomas, Ont.	6497.	362.	4.64	365
Kirkcarswell Nicky 5th, 39395,	McMillan & Leggat, Trout River, Que.	6362.	253.	3.97	339
Helena's Rose of Springbank, 36844,	J. W. Waters, Moorefield, Ont.,	6268.	263.	4.18	353

CANADIAN AYRSHIRE BREEDERS' ASSOCIATION,
W. F. STEPHEN,
Secretary-Treasurer

IN-BREEDING

Concentrating Blood of Related Animals to Intensify Desirable Characters

WHATEVER the objections in theory to the in-breeding of farm animals, the fact that leading breeders in Great Britain have been practicing it for many years is suggestive. To what extent they have done so is not known, but twenty-six of them whom the Breeders' Gazette questioned a few years ago frankly acknowledged that they practiced inbreeding. The question was not put to others, so that in this case the affirmative answers totalled 100 per cent. It is well known that a number of successful American breeders attribute their constructive work largely to inbreeding.

There are no unqualified "thou shalt nots" in the realm of animal breeding: neither is there anything mysterious in connection with the introduction or outcome of inbreeding; but if the practice is not to operate as a "two-edged sword", with which it has often been compared, several factors should be carefully considered. It is the object of inbreeding to intensify and fix a type or group of desirable characteristics by concentrating the blood of related animals which happen to approximate the type or exhibit the chief characteristics idealized. If the animals are free from important constitutional defects, then their union with a view to combining and emphasizing their joint physical merits in the offspring may safely be effected. In many instances the closeness of inbreeding has extended to sire and daughter and dam and son, with various subsequent combinations intended to concentrate the heredity of outstanding individuals.

Transmissibility of Defects

What is to be remembered is that defects are commonly more surely and prominently transmissible than structural or physiological values, so that inbreeding often results in the gaining of a little and the losing of a great deal, depending on the make up, health and vitality of the animals involved, and also upon their immediate ancestors in respect of these factors. Inbreeding, then, in those cases in which the animals are uniformly superior individuals, constitutionally vigorous and healthy, may be considered wise; while it is decidedly otherwise in cases where the animals happen to be "good in some points and mighty poor in others", for the others are almost sure to make whatever is gained an expensive loss. But if the animals which it is proposed to inbreed are good individuals, strong in constitution, and healthy, there are good reasons why this method of increasing the heritability of characters or points, and of stabilizing type should be practiced by breeders whose experience, observation and study qualify them for sound judgments as to the problems involved.

Warning to Notice

In-breeding as a practice is for the experienced breeder rather than the novice. Its success depends upon the cautious application of an intimate, personal knowledge which beginners do not possess. This is why inexperienced breeders, seeking (sometimes with an idle curiosity) a "short cut" to success, are warned against inbreeding.

In Great Britain, where the selective breeding of farm animals has been carried on for a century; where sons succeed their fathers generation after generation in this ennobling vocation, acquiring first-hand knowledge with which to work out plans previously laid; where the material to work with is not picked up here and there, but has been personally created; where men who love animals have the patience and take the time, be it a century, to master the principles of and do constructive work, inbreeding is common and logical. In America the conditions as regards the material to work with, and the personal equation involved, are quite different. Until they at least approximate those in England it is evident that we are not ready for any extensive adoption of inbreeding.

WHY NOT MORE SHEEP?

IMPORTS into Canada from United States of sheep for slaughter:

1913.. .. ..211,622 head
1914.. .. ..131,931 head

Imports of wool into Canada:

1913.. .. ..8,586,622 lbs.
1914.. .. ..9,516,579 lbs.

There are, according to the 1914 census, 2,058,045 sheep in Canada, shearing in the neighborhood of about 14,200,000 pounds of wool. This number represents but a small measure of what Canada's resources will permit in sheep production.

With its boundless areas of undeveloped land, why should Canada be under the necessity of importing its supplies of wool and mutton when sheep can undoubtedly be raised with profit not only in connection with mixed farming, but as well under conditions where cultivation of the land or the grazing of other animals is impossible?

1. The sheep is a dual purpose animal, producing both wool and mutton.
2. The initial expenditure is small. Every farmer can well afford the investment of the necessary capital in a few sheep.
3. Rapid monetary returns are received, the wool clip and the lamb crop being saleable annually.
4. Expensive buildings are by no means necessary. A warm lambing pen is required, but for the aged sheep, a sheltered shed to protect them from the winter winds is alone sufficient.
5. Weed destruction represents another asset. Sheep will eat and relish almost every class of weed.
6. Sheep admittedly improve soil fertility. Their manure is rich and uniformly distributed.
7. Except at certain seasons of the year, less time and attention need be bestowed upon the care of sheep than in the case of almost any other animal without thereby endangering successful results.

T. Reg. Arkell, Live Stock Branch,
Ottawa

THE MOO-COW-MOO

My pa held me up to the moo-cow-moo
So clost I could almost touch,
En I fed him a couple of times, or two
En I wasn't a fraid-cat—much.

The moo-cow-moo's got a tail like a rope
En it's raveled down where it grows,
En it's just like feeling a piece of soap
All over the moo-cow's nose.

En the moo-cow-moo's got deers on his head
En his eyes stick out of their place,
En the nose of the moo-cow-moo is spread
All over the end of his face.

En his feet is nothing but finger nails
En his mamma don't keep 'em cut,
En he gives folks milk in water pails
Ef he don't keep his handles shut.

'Cause ef you or me pulls the handles, why
The moo-cow-moo says it hurts,
But the hired man he sits down close by
En squirts en squirts en squirts.

—Edmund Vance Cooke, in "Chronicles of a Little Tot."

TONGUE TEASERS

Try to repeat these rapidly:

1. A growing gleam glowing green.
2. Six thick thistle sticks.
3. Flesh of freshly dried flying fish.
4. She says she sells sea shells.
5. Two toads tried to trot to Tedbury.
6. Give Grimes Jim's great gilt gig whip.
7. Strict strong Stephen Stringer snarled slickly six sickly silky snakes.

AUCTION SALE

— OF —

200 SHEEP, 100 SWINE and 100 CATTLE

(Males and Females) All Pure Bred and Registered

ORGANIZED BY THE

GENERAL STOCK BREEDERS' ASSOCIATION

OF THE PROVINCE OF QUEBEC

UNDER THE PATRONAGE AND WITH THE FINANCIAL HELP OF THE

Hon. J. E. CARON, Minister of Agriculture of the Province of Quebec

---

AT MONTREAL

AT THE DELORIMIER PARK

At 10 A. M.

WEDNESDAY, 13th October, 1915

AT QUEBEC

On the Exhibition Ground, At 10 A. M.

WEDNESDAY, 20th OCTOBER, 1915

The animals offered for sale will be registered in the Canadian National Records. There will be some Canadian, Ayrshire and Holstein cattle; some Leicester, Cotswold, Lincoln, Shropshire, Hampshire and Oxford sheep and some Yorkshire, Berkshire, Chester and Tamworth swine.

CONDITIONS:—Cash, except to Farmers' Club and Agricultural Societies which will be allowed time on terms that will be given by the Department of Agriculture of Quebec.

Purchasers assume all responsibility from the moment the animals have been adjudged to them. For further particulars apply to:—

J. A. COUTURE, Secretary of Stock Breeders' Association

49 GARDEN STREET, QUEBEC.

REPELLENTS FOR PROTECTING ANIMALS FROM THE ATTACKS OF FLIES

THE results of tests with various substances designed to keep flies from annoying cattle, horses, and mules, are shortly to be published by the U. S. Department of Agriculture. In these tests, the specialists of the department found that there were substances which, if applied to animals, would keep the biting flies, such as the stable fly and horse fly, the bot fly, and the screw worm fly, away from the animal for from one to four days. They also tested a number of substances to be used on wounds to prevent the screw worm fly from depositing its eggs, and the housefly from interfering with the wound and possibly infecting it.

Various kinds of flies tend to injure cattle by weakening them and reducing their milk supply. It is fairly well established that the stable fly does considerable damage, especially in northern Texas, where it was found that they killed stock directly, made cattle more subject to the recurrence of Texas fever, and reduced milk supply, causing a loss estimated at over $25,000 in a single year. The test experiments with dairy cows seem to indicate that the effect of flies on milk is not of great economic importance, although evidence seems to show that animals protected from flies feed better and are generally in better condition. Reduction in milk, some authorities believe, is due as much to the fact that cows do not graze as freely in the hot sun in summer as at other seasons.

In general, the conclusions are that many of the substances, such as pyrethrum powder, camphor, citronella, and sassafras, while temporary repellents, lose their effectiveness very shortly. Ten per cent solutions of the liquids in cottonseed oil, therefore, commonly have to be applied daily.

Various oils, emulsions of oils, and mixtures of oils are used in repelling flies. Crude petroleum, cottonseed oil, fish or train oil, and light coal-tar oil may be used pure.

Jensen (1909) recommends the following formula, which is said to protect cows for a week :

Common laundry soap	1 pound.
Water	4 gallons.
Crude petroleum	1 gallon.
Powdered naphthalin	4 ounces.

Cut the soap into thin shavings and dissolve in water by the aid of heat; dissolve the naphthalin in the crude oil, mix the two solutions, put them into an old dasher churn, and mix thoroughly for 15 minutes. The mixture should be applied once or twice a week with a brush. It must be stirred well before being used.

Fish oil is rated as one of the best repellents and has been used alone and in combination with various other substances. Other substances that have repellent qualities and that have been used in various mixtures are pine tar, oil of tar, crude carbolic acid, oil of pennyroyal, and kerosene. The protective action of fish oil is stated to range from less than two days (Parrott, 1900) to six days. Moore's formula is said to protect for two days. This mixture is safe when applied lightly with a brush, but not when applied liberally with a pail spray pump. The formula is as follows:

Fish oil	100 parts.
Oil of tar	50 parts.
Crude carbolic acid	1 part.

Laurel oil is a very effective repellent. Mayer (1911) found that the protection lasted from 2 to 12 days. The oil when used pure has an irritating effect unless it is applied lightly. According to Mayer the irritating effect may be overcome by combining it with linseed oil in the proportion of 1 to 10. In the experiments of the Department of Agriculture, it was found that 10 per cent of laurel oil in cottonseed oil was active for less than a day.

A number of formulas for repellents for application to wounds have been recommended by various authors.

In experimental tests carried out by the department the following results were obtained:

A 10 per cent mixture of crude carbolic acid (21.8 per cent phenols) in cottonseed oil has a very strong repellent action on flies, but this lasts less than a day, in consequence of which it is necessary to apply the mixture every day. The mixture should be applied lightly with a brush, since a heavy application with a spray pump is likely to cause phenol poisoning.

Mixtures consisting of 10, 20, and 50 per cent of pine tar in cottonseed oil have marked repellent qualities. They should be applied lightly and it is necessary to apply them every day. A liberal application of a 10 per cent mixture is deleterious to animals. This is also the case with a half-and-half mixture of pine tar and Beaumont oil when applied lightly with a brush.

A mixture of oil of tar (14 per cent phenols, volatile with steam) in cottonseed oil and in Beaumont oil has a very marked repellent action. A 10 per cent mixture of oil of tar in cottonseed oil is safe. A half-and-half mixture of oil of tar and cottonseed oil when applied liberally with a spray pump and 50 per cent oil of tar in Beaumont oil applied with a brush are not safe; 10 per cent oil of tar in Beaumont oil is safe. When applied lightly it is necessary to apply 10 per cent oil of tar in cottonseed oil or 10 per cent oil of tar in Beaumont oil every day.—Weekly News Letter, U. S. Dept. Agr.

THE DAIRY

CLASSIFICATION OF CREAM

Department of Agriculture, Province of Quebec

REGULATIONS concerning the classification of cream, the making of butter, etc., in accordance with the authorization given the inspector-general of creameries by article 2031g, *amending the Revised Statutes of* 1909, *respecting the Dairy Association of the Province of Quebec and the manufacture of dairy products*

1.—The classification of cream shall be based on its flavour and odour, its fat contents and its acidity when delivered at the creamery.

a).—In order to be classified as No. 1 or 1st class, cream must have an agreeable odour, a mild and clean flavour, with at least 35 p.c. of fat, and an acidity not exceeding .20.

b).—Cream shall be classified as No. 2 or 2nd class when its odour and flavour are not very agreeable, when the percentage of fat is not below .30 and its acidity does not exceed .24.

c).—All cream which cannot be accepted in either of those two classes shall be returned to the farmer to whom it belongs and who has produced it.

The apparatus for ascertaining the percentage of fat in cream shall be either the "Babcock" or the "Gerber"; those for ascertaining the acidity shall be the "Dormic" or Tourchot" acidimeter.

2.—As the federal law expressly forbids the use of preservatives for preserving milk and cream, every infraction of this kind must be reported to the inspector-general by the head maker of the creamery.

3.—The head maker must keep a special register for entering all ascertainments of percentage of fat, acidity and good or bad odour and flavour of the cream received.

He shall, when necessary, send copies of such ascertainments to the secretary or treasurer of the patron's district, and also to the president of such district.

The district inspector, or the inspector-general, or any officer duly authorized by the Department of Agriculture, shall have the right to examine such register.

4.—As the cream must be delivered at the creamery in the producers's can without being mixed with any other, the owner of the creamery must wash out the can very carefully and sterilize it with live steam immediately after washing.

5.—The license or diploma as butter or cheese-maker and the certificate of expert tester of milk and cream, held by any head maker of a factory, shall be cancelled if such maker does not conform to the present regulations.

St. Hyacinthe, 18th March, 1915.

J. D. LECLAIR,

Inspector-General of Creameries.

These regulations have been approved, after having been studied by the members of the Board of Examiners of the Dairy Association of the Province of Quebec.

Examiners:—

(Signed) J. D. LECLAIR
" ELIE BOURBEAU
" J. A. PLAMONDON

St. Hyacinthe, 18th March, 1915.

THE QUEBEC CHEESE MAKERS' AGRICULTURAL CO-OPERATIVE SOCIETY

Story of a Co-operative Selling Agency—Grading Has Resulted in Improvement of Quality and Higher Prices

SOME five years ago thirty men formed themselves into the Quebec Cheese Makers' Agricultural Co-operative Society, each taking up one ten dollar share—one dollar paid up. The reason given by Mr. A. Trudel, the manager of the society, for its formation was the poor quality of cheese made and marketed in Quebec; to put the situation in his own words, "the best cheese paid for the poor cheese". The work of the society was to improve the quality, and by doing this establish a market for the product that would enable them to pay the farmers more for their milk.

From the small membership of thirty the society has grown until to-day it is handling the output of over two hundred cheese factories and about one hundred and twenty-five butter factories. The membership has grown to sixteen hundred, each holding a ten dollar share. This year it increased its reserve fund by over $10,000, and for the past two years in addition to paying operating expenses, has paid a 6 per cent dividend. As each factory averages about thirty-five farmer patrons, the society practically controls the output of 11,375 farmers.

All butter and cheese received at the headquarters of the society in Montreal is carefully graded by men supplied by the Provincial Government, though this is the only help received from the Government. The society is entirely self-sustaining. Weekly or semi-weekly sales are held by the manager in Montreal, where the society has storage capacity for 10,000 boxes cheese and 6,000 butter. No products are exported by the society directly, all being sold at public auction. The amount of cheese and butter handled last year was 83,612 boxes of white cheese, and 14,519 of colored cheese, which sold for $1,126,223.32; and 39,678 boxes of butter worth $569,933.79.

In addition to butter and cheese, eggs to the value of $3,335.92 and poultry worth $3,087.34 were sold by the society, the eggs and poultry coming from twenty poultry societies scattered throughout the province, that are affiliated with the larger cheesemakers' organization.

A Great Handicap

According to the officers of the society the cheesemakers of Quebec are still suffering for the shortcomings of the cheese marketed many years ago. Quebec cheese is not favorably received on the English markets, even though of late years the quality has improved. Over there the cheese is graded according to the locality in Canada from which it comes, usually as Ontario, Eastern Townships and Quebec. As a result the cheese made in the latter province suffers in price, and though the quality is often the equal and sometimes the superior, of the Township and Ontario cheese, the price it commands does not improve. It may be that the cheese gift of the province will help to convince the "Old Country" buyers of the standard of quality now reached by Quebec cheesemakers.

The following extract from the 1914 annual report of the society is evidence of the improvement wrought by the work of the society.

"You will notice that the prices realized this year for butter and No. 1 cheese are higher than the prices paid on the markets of Cowansville, Que., and Brockville, Ont. Before this Co-operative Society came into existence, the prices realized on these markets were from half to three-quarter cents higher than those of the average Quebec market. The prices paid by this Co-operative Society would be still higher than they are if the quantity of the products received was larger. This would be very easy if the society could count on the encouragement of a larger number of farmers and makers of butter and cheese."

The average society prices from May to November for cheese were: white No. 1, 13.76 cents; No. 2, 13.61; No. 3, 13.47; colored, No. 1, 13.83, and No. 2, 13.55. The average price at Brockville, Ont., being 13.65.

Considering the poor opinion held of Quebec cheese when exported it seems strange that the dealers in Montreal are willing to pay more for it at public auction. It is learned on enquiry, however that it is not a difficult matter to take off the "Quebec" printed on the boxes and substitute, "Brockville" or "Ontario".

Federal Standards

Now that the Co-operative Cheesemakers' Society has made considerable progress in the quantity of produce handled and also in the quality, it faces the proposition of finding some means of overcoming the handicap experienced on export markets. The cheese made in Quebec compares favorably with the best made in Canada, yet the buyers still adhere to the system of practically grading by province.

There seem to be two methods of overcoming this, the first an active advertising campaign in favor of Quebec cheese, by establishing agents in Great Britain, and the second, a revising of the cheese grades. As they stand the three grades for white and colored cheese are all right, but the name on the box creates the difficulty for the makers in Quebec. In this case it would seem that there is "a lot in name" as far as the buyers abroad are concerned, though dealers in this country are apparently of opinion that "the cheese smells and tastes as well," even though the name be changed. Having established a reputation for Western or Ontario cheese, it would seem unfair to them to have the name eliminated, though there seems to be little hope for the more easterly province until this is done, or until the buyers are in some way made to understand that Quebec cheese has lost its poor reputation, and now stands on the market the equal of any made in Canada.

The manager of the society, August Trudel, holds that cheese made in Canada irrespective of the part it comes from should be sold as Canadian cheese. There seems to be reason for this view, particularly when it is remembered that the cheese handled by him commands the better price, and some do not object to remarking it for export.

Pasteurized Butter

Of the 39,678 boxes of butter handled last year by the society, 6,742 come under the grade "pasteurized", and in a comparison of prices, it stands first, averaging 26.07 cents a pound, No. 1 selling for 25.87; No. 2, 25.24, and No. 3, 22.10. This difference in price is due to the better keeping quality of the pasteurized butter, it being strongly advocated by the dairy instructors at the various provincial dairy schools.

That the quality of cheese and butter has been influenced for the better by the selling through this Co-operative Society is beyond question. This is accomplished by the grader reporting to the maker any defects in his product, and suggesting how they may be remedied.

Farmers are beginning to understand the advantages secured by the dealings of the society, and in some cases they have compelled their makers to become members, and to sell through its officers.

The scope of the society is being gradually broadened and this last spring 6,000 gallons of maple syrup and 25,000 pounds of sugar were received and marketed.

COOLING OF MILK

EXPERIMENTS by the Dairy Division of the U. S. Department of Agriculture, show that the milk in the top of the can just above the water level in the cooling vat cools much more slowly than the milk that is below that level. The cold milk being heavier than the warm will remain at the bottom of the can, while the warmer, and therefore lighter portion will remain at the top, and pratically no circulation will take place. It is therefore important to stir the milk while cooling. In the experiments all the cans were cooled by the same methods. The milk in some of the cans was stirred every 15 minutes while that in others was not. The water in the cooling tank was 62.6 degs. F. The milk that was stirred cooled from nearly 90 degs. to slightly above 60 degs. in three hours. The unstirred milk did not get down to a similar temperature for four hours and fifteen minutes. Meanwhile, in the unstirred milk all the milk above the water level in the running water was 5 to 6 degs. warmer. The advantage of stirring is emphasized by the fact that at the time the milk was stirred the temperature of the room was over 6 degrees warmer than was the case when the unstirred milk was put into the running water. The time taken to cool the milk in either case, however, is too great for good results, and the test served best to demonstrate the necessity of employing some form of milk cooler suitable for farm use, and more efficient than running well water.

CLEAN MILK

Proper Equipment and Painstaking Care Necessary to Keep Clean Milk Clean — Score Card Shows Points to Observe

MILK from clean, healthy cows, milked by clean men into clean utensils, may, nevertheless, easily become contaminated before it reaches the consumer. There is, therefore, no point at which the modern dairyman can afford to be careless.

The Milk-House

The milk should be taken at once to the milk-house, a building which should be convenient to the barn, but so placed as to be free from dust and stable odors. Preferably it should be in a well-drained spot, somewhat higher than the barn and away from the pig pen, the barnyard, and all other sources of contamination. Under certain circumstances it is permissible to have the milk-house in the same building as the stables, but in this case it should be provided with a separate entrance and the partition walls should not be pierced by any door or window.

The interior of the milk house should be divided into two rooms in order that the utensils may be washed in one and the milk handled in another. All unnecessary ledges or rough surfaces should be avoided in the interior, as these tend to collect dust and dirt. Round edges of walls are also a convenience in cleaning. The floors should be of concrete and pitched to drain through bell traps. For the walls and ceilings, cement plaster on painted metal lathing is best. Thorough ventilation is a necessity and ventilators will be found desirable in keeping air fresh and free from odors. No system of mechanical ventilation, however, can take the place of fresh air and sunlight, so that windows are of prime importance. In summer these must be kept screened in order to keep out flies and other insects.

The Water Supply

A plentiful and convenient supply of water is a necessity. Purity in the water is the first and most obvious requisite. Outbreaks of typhoid fever in cities have more than once been traced to dairy farms where the wash water was impure. The water which comes from shallow wells that receive surface drainage or seepage from barnyards or pastures should never be used. After purity, the convenience of the water supply should be considered. If it is not possible to have the gravity system, a supply may be piped from an elevated tank fed by a hydraulic ram, engine, windmill, or hand pump.

The Utensils

In order to make sure that the utensils are properly washed, convenient arrangements for heating the water must also be made. The utensils should be rinsed in cold water immediately after being used and then washed thoroughly in hot water to which soda or some washing powder has been added. Brushes are preferable to cloths for washing, as they are more easily kept clean and do better work. After washing, the utensils should be rinsed once more and then sterilized. This can be done by immersing them in boiling water for at least two minutes, or by holding them over a steam jet for the same time. The most effective method, however, is to put them in a hot closet thoroughly sterilized with steam. Such treatment will destroy or render harmless all the disease-producing bacteria commonly found in milk. While still hot the utensils should be removed from the steam or water and allowed to dry from their own heat, being kept inverted in a clean place, free from dust, flies, and other forms of contamination.

If the proper kind of utensils are used, these precautions will be found much less thoublesome. Wooden utensils are particularly hard to sterilize, and, therefore, are not used in the best-equipped dairies. Battered and rusty ware is also hard to clean, and contact with iron may injure the flavor of milk. Any utensil with complicated parts, crevices, or inaccessible places should be avoided.

Weighing, Straining and Cooling

In the milk house the milk should be weighed, strained, and cooled at once. The object of weighing is to enable the dairyman to know the yield of each cow in order that he may eliminate from his herd the unprofitable ones. Co-operative milk-testing associations now do this work in many cases for farmers with small herds, but there is no reason why it cannot be done by the dairyman himself it it is not convenient for him to join some association. The straining of the milk, which is done in order to remove any dirt that may have fallen into it, is best accomplished by a layer of sterilized absorbent cotton between two cloths, or else by straining through several thicknesses of cheesecloth or similar material. These cloths should be washed just as the other utensils are, boiled for five minutes, and then hung in a clean place to dry.

To retard the growth of bacteria, milk must be cooled immediately to a temperature of 50° Fahrenheit, or lower if possible. Ordinarily this can be done most satisfactorily by placing the cans in a tank, preferably of concrete, which contains enough ice and water to come well up to the neck of the can. The cooling will be hastened if the milk is frequently stirred with a clean stirrer. A more rapid method is to run the milk over a cooler, in the interior of which is cold running water, but if the air is not pure the milk will be contaminated in the process. Warm fresh milk should never be mixed with milk that has already been cooled, as this tends to undo the work already done. Milk should be kept in ice water until it is loaded on the wagon to go to the station. During the journey the can should be protected from the heat of the sun by jackets or by blankets which will keep the milk cool. Bottled milk may be kept cold by the use of caked ice placed in the crates.

HOME CARE OF MILK

Milk Sours Very Slowly at Low Temperatures—Clean Receptacles Aid in Keeping Milk Sweet — Whipping Cream

WITH the advent of warm weather the care of milk in the home becomes more complex than during the late autumn and winter. Heat to the extent accumulated by allowing milk to stand on a warm porch or in the sun is enough to start the bacteria in milk to multiplying at a rapid rate and thus make it unfit for use as sweet milk. The hot days also bring the flies, the great germ carriers, and the clouds of dust laden with bacteria, which, when coming to rest on milk receptacles, may easily contaminate the milk.

Milk is regarded as a natural culture medium for bacteria and the rapidity with which the various forms will multiply under the proper temperatures is astonishing. It has been shown that if a cubic centimeter (about one-half teaspoonful) of milk containing 10 bacteria is kept at 68° temperature for 24 hours the bacteria will have multiplied into about 61,000. In the same milk, if held at 50°, the growth of bacteria would be very small, possibly as low as 40 in 24 hours. Milk which contains a large number of bacteria is either not fresh or has come from a diseased cow or has otherwise been contaminated.

Protect from Flies

Flies are possibly the most dangerous bacteria carriers which are likely to come in contact with milk. These scavengers may convey the germs of typhoid fever or other contagious diseases from the sick room or excreta to the milk. Typhoid epidemics have been caused by flies spreading the germs. Milk should be guarded from flies as rigorously as you would avoid exposure to disease.

Cool Promptly

Cows are now out on pasture, and milk is more easily produced under sanitary conditions than during the winter months when the cows are stabled continuously. Milk may be handled by the most correct and sanitary methods known, and yet if it is not cooled immediately after milking and kept cool until consumed, it very soon begins to change and grow sour. In fact, the bacterial content increases rapidly as long as the milk remains above 50°F. The bacteria are dormant or increase slowly at a lower temperature. For this reason, every precaution for keeping milk cold from the time it is produced until it reaches the consumer is essential, and especially so during the warm weather.

Avoid Contamination

Milk may absorb impurities whenever it is exposed to the air or placed in unclean vessels. The amount or degree of contamination depends on the cleanliness of the air and of the utensil. Even the air of a so-called clean room contains some impurities. If the producer and dealer have done their duty, there is left at the consumer's door a bottle of clean, cold, unadulterated milk. But the consumer also has responsibilities in handling milk so that it continues to be fit for consumption, especially as food for babies. The milk in the home may be placed in unclean vessels, or exposed unnecessarily to the air, or not kept cool until the time of using. Thus things may happen to the milk affecting its quality, many of which occur through carelessness.

Deliver in Clean Bottles

The expression, "a bottle of clean, cold, unadulterated milk," describes the kind of milk which should be delivered to the home. The method of dipping milk from large cans and pouring it into the customer's receptacle in the street, with all the incident exposure to the air, not always the cleanest, is a bad practice. Drawing milk from the faucet of a retailer's can is almost as bad as dipping milk, although the milk is not exposed to the air as long as by the dipping process. Besides the insanitary part of this method, some consumers, unless the milk is kept well agitated, are likely to receive less than their proportion of cream. The custom of setting out at night an uncovered vessel which collects thousands of bacteria from the street dust before the milk is put into it is obviously very insanitary, and yet it is practiced to a large extent. If milk is to be received in a bowl or pail by the consumer, it is worth while to have it delivered personally to some member of the family, or, if the receptacle is to be placed in waiting for the milk deliverer, it should be covered with a plate, or better still, a glass preserving jar may be used in which nothing but milk is put. The jars with the glass tops are preferable; no rubber bands should be used.

Do not Expose to Sunlight

Direct sunlight on the bottle of milk warms it rapidly and increases the bacterial content. Milk which is delivered very early in the morning, say, at 4 a. m., and remains out of doors until 9 or 10 o'clock, is very likely to become warm and less fit for human consumption than if it were taken in the house and placed in the refrigerator early in the morning.

Leave in Bottles

Milk should not be transferred from the original bottle into another receptacle until just before consumption. The bottle should be kept covered with a paper cap or an inverted tumbler as long as the milk is in it. Milk deteriorates by exposure to the air in the pantry, kitchen, or nursery. Housewives are familiar with the ability milk has to absorb smells from strong foods like fish, cabbage, or onions. It is obvious, therefore, that such foods should be kept out of the refrigerator which contains milk.

If the milk is received in a bowl, pail, or other receptacle instead of a bottle, the same rules apply to the keeping of the milk as those mentioned above for bottled milk. Milk from the grocery store or bakery which is kept in a can, open most of the time, and possibly without refrigeration, is to be strictly avoided.

Keep Refrigerator Clean

The refrigerator, unless kept scrupulously clean, often is in itself a source of the bad flavor in milk. The refrigerator should be inspected at short intervals, at which times the outlet for the melted ice should be freed, the ice rack cleaned, and the place where the food is kept scalded with a salsoda solution. Even though the refrigerator is cold, a few drops of spilled milk, or a small particle of food neglected, will soon contaminate it.

Wash Bottles and Utensils Promptly and Thoroughly

Milk bottles are made for milk and not to hold sundry other foods. As soon as the milk bottle is empty it should be rinsed with lukewarm water until it is clean and then set bottom side up to drain. Bottles should never be returned in a dirty or filthy condition. All utensils with which milk comes in contact should be rinsed. washed, and scalded every time they are used. When cleaning these utensils, do not wash them in dishwater or wipe with ordinary dish towels. First rinse them and then boil in clear water and set away unwiped. If the receptacles are hot, they will soon become dry without wiping.

When a baby is bottle fed, every time the feeding bottle and nipple are used they should be rinsed in lukewarm water, washed in hot water to which a small amount of washing soda has been added, and then scalded. Never use a rubber tube between the bottle and nipple.

In Case of Disease

If a case of typhoid fever, scarlet fever, or diphtheria breaks out in the family, do not return any bottles to the milkman except with the knowledge of the attending physician and under the conditions prescribed by him.

Whipping Cream Should be Cold

The above suggestion on the care of milk are equally applicable to cream. Often the housewife finds that the cream she has will not whip. Dairy specialists point out that to obtain satisfactory results in whipping cream it should be cold and of the right thickness, containing about 30 per cent or more of butterfat. Ordinary cream, designated as coffee cream by the trade, is altogether too thin to give good results. The whipping cream, as delivered by the milkman, contains 30 to 40 per cent of butterfat. Thoroughly chill the cream before whipping by placing it in a covered bowl on the ice. The whipping process is also aided and hastened by standing the bowl in a pan of ice water.

Weekly News Letter,

U. S. Dept. Agriculture

J. Laughland, District Representative of the Ontario Department of Agriculture for Simcoe, recently outlined to a large audience at Collingwood a live stock policy, which is clear-cut, business-like and concise. In view of the real situation in live stock to-day it is well worth wide repetition. It was as follows:

Select the class of stock that will give best results under local and other essential conditions.

Keep the best females to breed from.

Use only a good pure-bred sire.

Feed well. Good feeding goes hand in hand with good breeding.

With the young calf, remember that if you once allow the natural calf fat to disappear you have allowed the calf to experience a set-back, and that for just so long a time you have fed the calf at a loss. You can never bring back the same kind or quality of flesh to it again.

Avoid shoeing colts which are not going to be called upon to do work on the road. Shoes are not necessary for farm work, but once worn the colt cannot so well go without them, especially on the front feet.

If bread is the staff of life what do you call milk?

Holland is a heavy producer of oleo, yet Dutch butter sells at a high figure and dairying is profitable. That is because the Government puts its brand upon Dutch butter when it is honestly made.

POULTRY

SEASONABLE POULTRY HINTS

DURING the hot weather be on the watch for mites in the houses. If they are discovered it will be necessary to give the house a thorough cleaning;—full directions for ridding a house of mites may be had by writing to the Dominion Poultry Husbandman.

Market the Early Cockerels:—The early cockerels should also be marketed as soon as they reach broiler size, as they will make more money when sold at that age than if held over until fall, when the market is always more or less glutted. Another advantage in marketing the cockerels as soon as ready is that it allows the pullets and late cockerels a much better chance to develop.

Shade and Range:—During the warm weather the chicks require shade from the hot sun and if there is no natural shade it should be provided by raising the coops, cotton and board screens, or with boughs of trees, etc. The best shade is in a corn patch or even a root field and if the coops or colony houses can be ranged along the headland ideal rearing conditions will be obtained.

Feeding:—When the chicks are on range as noted above it is not necessary to feed every day, rather provide a self-feeding hopper and in it put mixed hard grains;—see that the supply is not exhausted, and that the chicks have water or milk to drink.

Early Eggs:—Pullets should start to lay before the cold weather, and they should be in their winter quarters several weeks before they begin to lay. Get their houses ready early in October, sort out the early pullets and put them in by the middle of October at the latest. It is the early eggs that pay and if pullets do not begin to lay before December they will not likely start till near February. *Attention given in October means dollars.*

Crate Feed Cockerels: — Do not market any cockerels without finishing. A pound in the crate is the cheapest pound put on the carcass and enhances the price of the whole bird. You cannot afford to market birds without this finishing.

F. C. ELFORD,

Dominion Poultry Husbandman

SHIPPING CRATES

LARGE numbers of live birds are shipped to market each year in such a way as to cause heavy losses in shrinkage and many deaths. Very frequently the shipping crates are not properly ventilated with the result that many birds are suffocated. Death from suffocation is quite common where the poultry is shipped long distances is warm weather. A number of birds packed closely together in a tightly boarded box give off considerable heat and it requires a chicken with a very strong constitution to stand the conditions. All shipping crates should be made so that the chickens get plenty of air. The sides, ends and top should be slatted, the slats being about ¾" apart; the distance between the slats being wide enough to allow for circulation of air but not wide enough to allow chickens to put their heads through. If the top slats are more than 1½" apart they should be covered with wire, otherwise many deaths will occur from chickens putting their heads through when the crates are being handled. The crates should not be less than 12" high and not more than 16". They should not be more than 30" wide and 48" long. By shipping birds in comfort less deaths will occur and the profits to the shipper will be greater.

M. A. JULL

SUMMER CARE OF PULLETS

DURING the early part of the growing season the pullets which are to be kept for laying purposes are reared with the rest of the chickens of the flock and receive the same attention. As the season advances the cockerels and undesirable pullets are selected out from time to time to be sold as broilers or later to be fattened as roasters, the pullets for laying are kept by themselves. They must be given proper treatment to insure their being in good laying condition at the proper time.

Pullets should be ready to lay about the middle of October or the first of November. The majority of the general purpose breeds—Plymouth Rocks, Wyandottes, and Rhode Island Reds—do not usually begin to lay before they are six months old, so that they should be hatched before the first of June. Breeds of the egg-laying type may be hatched up to about the middle of June, since they mature more rapidly than other breeds and consequently begin laying earlier.

The growth of the pullets up to maturity should proceed without interruption because a check to growth at any stage usually retards laying at maturity. Influences which are unfavorable to the development of the body will also be unfavorable to the proper development of the reproductive organs, upon which successful egg production depends. Free range on clean soil, with plenty of green food and shade are essential for good growth. The method of feeding the pullets should be the same as the method outlined under rearing.

Avoid disturbance of the pullet flock. The pullets should be kept in the same place and under the same conditions as far as possible. If the pullets are moved several times during the growing season it will undoubtedly retard normal growth and egg laying at maturity. They should receive regular treatment and careful handling at all times, for young pullets are very sensitive to strange objects and conditions.

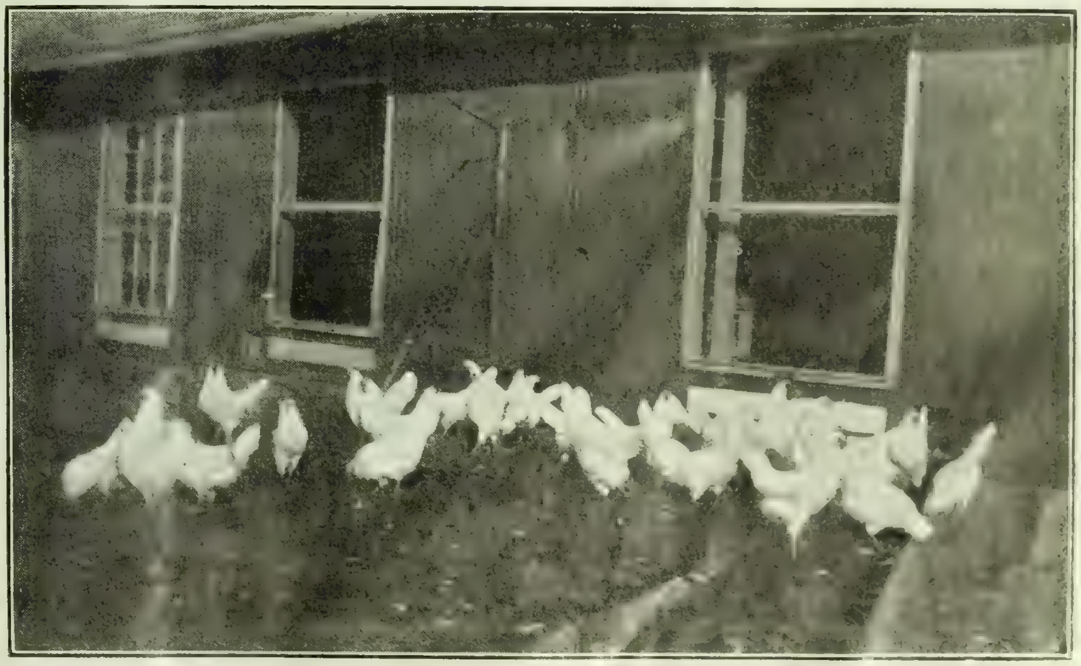
M. A. JULL

THE VALUE OF MINERAL ELEMENTS IN POULTRY FEEDING

OBSERVATIONS from practice in poultry feeding give the general impression that the quantity of mineral matter supplied to fowls should be sufficiently large, but little attention has been given to its composition.

All foods do not contain the fourteen elements, from which the animal body is constructed, in amounts sufficient to sustain growth, and it is recognized that deficiencies in the amount and kinds of nutriment available may affect not only the size but also the character of the growth of animals. On the other hand, there is a prevalent idea that the mineral nutrients are present in all foods in excessive amounts and that, therefore, the study of this matter is not of great practical importance. The fallacy of such an assumption is clearly borne out by experimental data at hand, although detailed information with reference to mineral nutrients in poultry feeding, in particular, is limited. Available results of such work are obtained from Ingle in England and South Africa, Laurie in Australia, Wheeler and Bolté in the United States. Valuable comparative data is obtained from the investigations of Forbes of the Ohio Experiment Station (U.S.).

Black Orpington cockerel owned by Poultry Department, Macdonald College.



A pen of Single Comb White Leghorn pullets on the poultry plant at Macdonald College.

Concerning feeding practice it may be said that there is no particular relationship between the compounds of the ash and the compounds in which the elements occur in plants and animals. But with this particular phase we are not chiefly concerned, since our object is to determine the mineral requirements for specific purposes.

Mineral Elements in the Fowl's Body

Calcium appears abundantly in the form of calcium oxide (CaO); three-fourths of the ash of the body is lime and seven-eights of the ash of bones is phosphate of lime. The presence in the body of calcium salts is necessary to muscular contraction.

Phosphorus occurs in a number of forms; inorganic phosphates, which occur throughout the body in solution in its fluids and also in the solid substance of the bones; lecithins which are found in all plant and animal cells; phosphoproteins and nucleoproteins. In the inorganic phosphates phosphorus is present as salts of the mineral bases, calcium, magnesium, potassium and iron. These are readily digested and assimilated and may be retained in the body and used for the various functions. Three-fourths of the mineral matter of the body is inorganic calcium phosphate.

Iron is one of the least abundant though most important elements in the body. Without iron the blood cannot carry oxygen.

Sodium is present principally as chloride, common salt, ($NaCl$.), but also as the phosphate and carbonate. Sodium salts are essential to cardiac relaxation. Without sodium and calcium salts, the heart is unable to function at all.

Potassium is present mostly as salts of mineral acids.

Magnesium, mostly as the phosphate, is found in small quantities in the bones.

Sulphur is an essential constituent of all of the proteins of the body.

The Functions of the Mineral Elements

When we consider that the mineral elements in the body are most of them strongly acid or basic, we know that their compounds have a tendency to become exceedingly active when in dilute solution. Thus, through their peculiar attributes the mineral elements maintain a very important relation to practically all the vital processes and they enter into the composition of every tissue and fluid of the body.

In considering the constructive purposes of the mineral elements we note that calcium, phosphorus, sulphur and iron are used in the formation of the essential structures in the body. Iron, also, through its affinity for oxygen, becomes a carrier of gaseous products and functions in the liberation of energy. Sulphur and phosphorus contained in proteid substances give rise to sulphuric and phosphoric acids and these acids are neutralized through the equilibrium existing in the blood between the alkali carbonates and the phosphates. Again the activity of enzymes, which function in building up and tearing down chemical compounds in the animal body, requires certain degrees of acidity or alkalinity which are maintained through the presence of mineral salts. "The control of both voluntary and involuntary mucles is accomplished through the proportion of calcium, magnesium, sodium and potassium salts acting upon them." Other functions of mineral salts are to serve in the movement of liquids throughout the body and its tissues, to facilitate vital processes involving the proteids, and to keep certain nitrogenous constituents, in solution, in the liquids of the body. Calcium in the blood is essential to its coagulation, and mineral chlorides furnish the chlorine of the hydrochloric acid in the gastric juice, pepsin being inactive except in the presence of hydrochloric acid.

The Mineral Elements must be Properly Balanced

It will be noted at once what a variety of functions the mineral elements serve in nutrition and it is also interesting to note the effects of lack of mineral nutrients. From Forbes we learn that Forster, a German physiologist, first proved that animals can live but a few days on food that is practically free from mineral matter, and, strangely, "that animals will live longer if given no food at all". In considering the possible causes of the deficiency of mineral matter—chiefly phosphate of lime—in the bones of animals suffering from a peculiar bone disease (osteoporis) Ingle was led to attribute its prevalence in South Africa to the peculiar diet used for working animals in that country—a diet composed often entirely of oat-hat or oat-hay and maize grain. Both of these foods are characterized by containing a high proportion of phosphoric acid and a low proportion of lime in their ash. In experimenting with rations to overcome the conditions resulting from continued feeding of oat hay Ingle prepared a diet to which he added various mineral salts and which gave very beneficial results. His work with horses led to further work with poultry.

In regard to the erroneous assumption that it is the amount and not the composition of the ash constituents that is important in bone formation, the feeding of bran to chicks may be taken as an excellent example. Bran is rich in ash and on this account it has been extolled as being peculiarly well fitted for bone formation. It contains, as a matter of fact, about 3.3% phosphorus pentoxide ($P_2 O_5$)and only about 0.3% lime and is therefore not especially suitable for the promotion of bone formation.

The results of the analyses of Lawes and Gilbert of the whole carcasses of various farm animals show that the total lime present exceeds the total phosphoric acid. In bones of animals the ratio is about 100 of phosphoric acid to 150 of lime. Seeds of all kinds contain far more phosphoric acid than lime though many contain considerable quantities of magnesia; there is always a preponderance of phosphoric acid. Stems and leaves of plants, as a rule, contain a preponderance of lime. If, as we have reason to believe, animals require for healthy bone formation and renewal, lime and phosphoric acid in approximately equal proportions, it is evident that a diet composed exclusively of the grains is not adapted to supply their needs and cannot be used, for long, without injury to health. From a consideration of these facts it appears possible that the value of green food or substitutes may depend chiefly upon the lime content.

Mineral Supplements to the Diet

Some years ago Ingle devised a preparation intended to be administered along with the usual food, adapted to ensure that the animals, so fed, should receive adequate supplies of all the necessary mineral constituents which might be lacking in their ordinary rations. This prescription he supplied to several correspondents in South Africa, and whenever tried the preparation proved very beneficial in preventing ill-health in poultry kept in confinement. In England and America where greater variety of food is usually available, the need for the preparation is perhaps not so great, but even with poultry kept under the best conditions it has produced under careful experimental conditions, a decided increase in the rate of growth of young poultry.

An interesting and suggestive contribution to the study of this question is given in experiments undertaken at the College Farm, Theale, England, under Mr. Edward Brown, late of the College Farm and at present President of the International Association of Instructors and Investigators in Poultry Husbandry. Experiments were conducted with a preparation of mineral salts prepared by Ingle as follows: common salt 30 parts, phosphate of soda 9, calcium fluoride 1, ferrous sulphate 1, bone ash 30, chalk 14, epsom salts 10, charcoal 2 and flowers of sulphur 3 parts, making 100 parts in all. Two lots of White Wyandotte chickens, besides others, were fed from birth in exactly the same way, excepting that one pen received a small quantity of the "mineral food" while the other did not. At eleven weeks old the nine chicks in the former pen weighed 18 lbs., or an average of 28 oz., the twelve chicks in the latter pen weighed 17 lbs., 2 oz., or an average of 20 oz. Remembering that the chicks were all fed in the manner usual at Theale — i.e., doubtless upon a varied diet — these results afford strong evidence of the usefulness of the "mineral food", for had the diet been composed of only one or two items, as is often the case with chickens in confinement, there can be little doubt that without this addition the growth would have been less than it was and the advantage correspondingly greater. Trials of laying hens, with a grass run, carried out by Mr. Edward Brown showed little or no effect so far as number or weight of eggs produced was concerned, but the birds receiving the mineral food came on to lay more quickly, but whether this result was due to the mineral food or to other causes cannot be stated. In other trials, carried out by Mr. F. Parton, Poultry Expert of the Leeds University, it was noticed that with pullets the mineral food induced the growth of larger combs, and that with Leghorns the combs of the pullets receiving the preparation grew perfectly erect instead of pendulous, as is usually the case.

In experiments to determine the source of material for the egg shell, Wheeler at the New York Experiment Station found that lime in the egg shell was largely derived from the calcium of oyster shell fed in a test comparing oyster shells with broken glass.

Wheeler found that most grain rations for growing chicks were improved by the addition of bone ash. Oyster-shell was found to be less valuable than bone ash and rock phosphate.

Growing chicks need calcium phosphate as a mineral supplement to the grain rations. Laying hens need calcium carbonate as a mineral supplement to the grain rations; egg shells are high in percentage of calcium since they are almost pure calcium carbonate.

In conclusion it may be observed that comparatively little has been done to determine specifically the value of mineral elements in poultry feeding, and yet, notwithstanding this, the available data shows conclusively that mineral elements are essential for the functioning of the vital processes as well as for the development of bone and eggs. It is clearly essential, then, that definite work should be undertaken to determine the most economical methods of supplying the required mineral salts in specific rations.

M. A. JULL

Drag the Roads

"When the smiles of spring appear,
Drag the roads:
When the summer time is here,
Drag the roads:
When the corn is in the ear,
In the winter cold and drear,
Every season of the year,
Drag the roads.
"When you've nothing else to do,
Drag the roads:
If but for an hour or two
Drag the roads:
It will keep them good as new;
With a purpose firm and true,
Fall in line; it's up to you—
Drag the roads."

—*The Kansas Industrialist*

C. F. Whitley says that solid and lasting success is to be attained through testing every cow—and acting accordingly. He estimates that this will take about ten minutes' time per cow for each month of the year. He invites every farmer who milks cows to write to the Dairy Division, Ottawa, for record forms and instructions as to how to go about it.

WOMAN'S WORLD

FOODS AND FOOD PREPARATION

Lesson XVII.—Cheese

Protein or Nitrogenous Foods.—Canadian Cheddar

WHEN one realises that *one pound* of Cheddar cheese represents the total casein (and most of the fat) in a gallon of milk it is easy to understand why it is used as a meat or fish substitute, or in other words as the protein or substantial dish in a meal.

Chemical Composition of Canadian Cheddar

Water	31.9
Protein or nitrogenous material	33.4
Fat	26.8
Ash or mineral matter	3.9

Taking these results as a whole one will not be far wrong in regarding cheese as made up of one third of water, one third of protein and one third of fat. Cheese is also rich in valuable mineral matter containing salts of lime, phosphorus, magnesium and iron, all of which are essential to healthy body tissues and normal blood. It is interesting to place the chemical composition of average beef beside this composition of cheese and then draw conclusions. The chemical composition of average raw beef, as given in a former lesson is this:—

Water	70.88
Protein or nitrogenous material	22.51
Fat	4.52
Mineral matter or ash	1.23

Nutritive value of Cheese

The nutritive value of cheese is very high. Its composition shows practically 66 2-3% of solid nutriment, protein and fat, and only 33 1-3% moisture; while beef contains from 70-73% moisture, the remainder being also made up of protein and fat. Beef then contains less than half as much nourishment as the same weight of cheese.

Economic value of Cheese

The economic value of cheese is very high. One pound of cheese at eighteen cents is equal in food value to two and a quarter pounds of average beef. It is therefore a very cheap source of material for growth and repair as well as for animal fat.

Dietary value of Cheese

These facts should establish the free use of cheese dishes to supply protein and fat, making it a food in every way comparable with meat, fat fish and eggs. The ease with which it can be prepared and the great variety of ways in which it can be served, should also make it a food peculiarly valuable to the housekeeper.

Like meat, fish and eggs, cheese should, when taken in quantity, be liberally supplemented with starchy food, e.g. bread, potatoes, crackers, rice, macaroni; and also with succulent foods, as non-starchy vegetables or fruits, which supply valuable cellulose and organic acids which cheese lacks. A menu so arranged, whether for dinner or luncheon, constitutes not only a "well-balanced" meal but should be as attractive and palatable as a meal with meat.

Popular misconceptions concerning Cheese

There seems to be a widespread belief that cheese is only suitable for food in small quantities, as an appetiser or as an accompaniment to other foods. Consequently we find it added to a meal which already supplies an adundance of nutritive material.

Why has not cheese been used in quantity, as an integral part of the diet, and why is it not holding the place which a highly nutritive and cheap food should hold at the present time? We know of no good *reasons*, but there are several *causes*. One is *habit*, which makes the meal *seem* incomplete without meat; another is that since cheese has a more pronouced flavour than meat it is not so likely to be generally accepted as the chief dish of a meal. Again, there is always one member of the family who does not relish cheese, in quantity.

Cheese is also commonly believed to be a food difficult of digestion. Perhaps the most important *cause* is that housekeepers, through lack of knowledge and experience are much less skilful in the arrangement of bills of fare in which cheese is the central food than they are in arranging menus in which meat is the protein dish. There really seems to be ground for prejudice in regard to cheese when we carefully consider the following paragraph.

Characteristics of Canadian Cheddar

1. It is dense and compact.
2. It is a very concentrated food being 66 2-3 per cent solids.
3. It contains a little acid formed during the process of ripening and this causes uneasiness in gastric digestion in some cases.
4. Each particle of protein (casein) in cheese is surrounded by a waterproof coating of fat and, as neither the mouth nor the stomach acts chemically upon fat, the intestines are left the burden of digesting both the fat and the casein.

As purchased, this cheese is indigestible and all the four points indicated are serious drawbacks to digestibility. Fortunately, however, these may all be overcome and cheese may be made perfectly and easily digestible.

Methods of rendering Cheese easy of digestion

1. Masticate it thoroughly or better still grate the cheese.
2. Overcome its concentration by mixing it with starchy foods, e.g. rice, macaroni, or by eating it with bread or crackers.
3. Overcome the acidity of cheese by adding a little baking soda to all cheese dishes.
4. Remove the waterproof coating of fat from the casein by mixing the grated cheese in a hot sauce, e.g. cream or tomato sauce, until melted.

Cheese as food for the Child

The practice, not uncommon, of giving lumps of cheese to young children is most unwise and cannot help but cause digestive disturbances. It it too concentrated a food for them, to say nothing of the density of its structure. The child likes the flavor and the result is hasty mastication. The stomach not being supplied with teeth finds the task almost impossible and during the minutes and hours which follow Nature cries out in the form of prolonged "stomach ache."

Cheese when given to older children should *not* be new cheese and crackers or bread which is not fresh should be eaten along with it. In this way hasty mastication is impossible, for the dry starchy food demands moisture to soften it, and in this way the saliva is not only getting in its work upon the starch but the cheese is being divided finer and finer and its particles becoming separated with starch particles.

THE COOKING OF CHEESE

Cheese dishes require to be cooked at a low temperature, as high heat hardens the protein in the cheese in the same way that egg white and all other proteins are hardened. Cheese dishes therefore should never be boiled, fried, cooked in a frying pan, or in an oven at a high temperature. Welsh rarebits which are cooked over the direct heat are most indigestible. Cheese should never be cooked in combination with pastry, for the starch in the flour demands high heat, and the cheese just requires enough to melt the fat. Either the digestibility of the starch, or that of the casein, must be sacrificed. High heat not only hardens the protein in cheese, but it overheats the fat, and the result is that fatty acids are set free which are irritating to the stomach.

Cheese dishes when cooked on top of a stove or over a flame should be prepared in a double boiler. When dry heat is used they should be baked as custards in a moderate oven, placing the dish in a larger vessel containing hot water. The water should come up on the dish as high as the contents, care being taken that the water at no time reaches the boiling point. Without these precautions it is almost impossible to make a success of a cheese dish. The presence of rubbery strings of cheese in

THE PREPARATION OF CHEESE SOUFFLE.
Showing the increase of volume when cheese is grated. The double boiler is essential for cooking cheese dishes.

A CHEESE CUSTARD.
In a pan of hot water ready to be baked.

cheese dishes is a more or less familiar occurrence.

The practice of using much butter with cheese is not good, for cheese is already rich in fat. It demands what it lacks — starchy foods and cellulose-rich foods, the latter being supplied in the form of either non starchy vegetables or fruits. This fact should never be forgotten in any menu in which cheese constitutes the substantial dish.

Cheese Recipes

The following are recipes of cheese dishes which if properly cooked are light, easy of digestion, very nutritious, cheap, and, last but not of least importance, "most palatable".

Cheese Souffle

1 cup milk (16 tablespoons).
4 egg yolks.
3 tablespoons (even) flour.
4 egg whites.
2 tablespoons (even) butter.
Pinch of baking soda.
1 cup finely grated Canadian Cheddar.
Dash cayenne.
Salt and pepper to taste.

Method

Mix to a smooth paste the flour with an equal quantity cold milk. Thin down with more milk until of pouring consistency. Add remaining scalded milk gradually and then cook mixture until fully thickened. Add the butter and finely grated cheese, stirring the mixture over hot water until cheese is dissolved. Pour mixture gradually into the beaten egg yolks, stirring all the time. Cook over boiling water for two minutes. Remove from fire, season to taste, and cool somewhat. Beat egg whites stiff and then add them to sauce mixture by careful cutting and folding. Pour into buttered baking dish, set in a pan of hot water and bake in a moderate oven until mixture is set. Test with a knife as for custards. 30 minutes is the usual time required.

Cheese Pudding

1 cup cheese, finely grated.
2-3 cup buttered bread.
2 cups milk.
Pinch soda.
2 eggs.
Dash of cayenne.
Salt and pepper to taste.

Method

Cube the buttered bread finely. Prepare the custard mixture and season it. Stir into it the cheese. Grease baking dish. Line it with the diced bread, and pour over it the liquid mixture. Let dish stand 15 or 20 minutes. Then place in a moderate oven in a pan of hot water until set.

Macaroni and Cheese

½ cup macaroni.
1 cup white sauce.
½ cup grated cheese.
1 cup tomato sauce.

Method

Cook macaroni until tender in 2 quarts of rapidly boiling salted water. Drain, rinse with cold water. Re-heat in white or tomato sauce into which the finely grated cheese has been stirred until dissolved. Season to taste.

NOTE.—Serve as a substitute for meat and potatoes. Rice and cheese prepared by the same method is a delicious dish. If white or cream sauce is used the dish may be garnished with slices of ripe tomato.

Rice or Macaroni and Cheese Scallop

Prepare macaroni and cheese. Put mixture in a greased baking dish, covering it well with fine dry buttered crumbs, using one tablespoon melted butter to one cup of crumbs. Place in oven long enough to turn crumbs golden. In this time mixture will be thoroughly heated.

NOTE.—Do not let mixture boil.

Duchess Soup

2 cups Brown or White Soup or stock.
3 tablespoons butter.
1 tablespoon chopped carrot.
3 tablespoons flour.
1 tablespoon chopped onion; 1 tablespoon chopped celery.
1 cup milk.
¼ cup grated cheese.
Salt and pepper.

Method

Melt butter and vegetables chopped fine. Cook until butter slightly browns. Stir in flour and mix well. Then add gradually hot stock and stir until it thickens and boils. Strain, add milk and cheese. Reheat carefully on back of stove, stirring until cheese melts.

NOTE.—Suitable for dinners when the substantial course is lighter than usual.

Cheese Custard with Potato Border

1 cup milk.
2 tablespoons flour.
1 tablespoon butter.
2 tablespoons finely grated cheese.
⅛ teaspoon pepper.

.Method

Make a sauce with the milk, flour, butter, salt, and pepper. Cook over hot water until no trace of the taste of raw starch can be detected. Then pour mixture gradually into slightly beaten egg. Return to double boiler and cook two minutes. Add cheese and stir until dissolved. Have ready hot mashed potatoes, well seasoned; whip hot milk into them until soft and very light. In a baking dish arrange a border of the potatoes making them as fluffy as possible. Pour in the centre the cheese custard. Reheat in oven, and serve hot. Garnish with parsley.

NOTE.—Suitable as the substantial dish at luncheon or supper. This same sauce may be poured around hot poached eggs before serving. One cup tomato juice may be substituted for the one cup milk.

Potted Cheese. (A delicious and nutritious sandwich filling.)

6 lbs. Canadian Cheddar.
½ cup vinegar.
¼ cup water.
⅛ teaspoonful cayenne.
1½ cups butter (soft).
1 tblsp. mustard.
5 teasp. salt.

Method:—Put cheese through a food chopper using the finest cutter, add vinegar, butter and half the salt and mustard, and a little cayenne. Mix and rub all together, taste and season more highly if desired. Pack in small jars. Pour over the top a teaspoonful of brandy then melted paraffin. Keep in a cool place.

Note:—Chopped olives may be added just before using.

E. B. RUTTER,

School of Household Science
Macdonald College

CANNING YOUNG VEGETABLES

EARLY summer is the best time for canning or preserving young vegetables such as carrots, beets, beans, onions, etc., which will form a special relish in winter. To a certain extent such young vegetables are canned commercially and can be bought in the store, but as a rule these commercial products cannot compare with the home-preserved vegetables and further their purchase price is beyond the purse of the average citizen. In France the commercial canning of young vegetables has reached the highest development and has prevented to a large extent the canning of the more mature products, especially peas, beans and tomatoes, as is done in Canada and the United States. There canned products are only served on special occasions, and then the more expensive young vegetables are used exclusively.

Our farmers' wives, who have the vegetables right at hand, and such people as are able to keep a vegetable garden, can preserve the young vegetables without much trouble when they are at their best, without having the drawbacks of the commercial operation. To preserve vegetables successfully we must accomplish two things; first kill all the bacteria present, and, further, prevent the entrance of new ones after the food is sterilized.

Some bacteria show more resistance against heat than others, and especially in the soil we find these resistant bacteria in large numbers. Therefore vegetables coming in contact with the soil need longer sterilization than other vegetables which are kept away from it. The careful housewife will find it to be much easier to preserve running beans and peas than dwarf peas and beans, for the simple reason that the latter are in contact with the soil and are splashed with mud by heavy showers. For the same reason cleanliness in preserving pays handsomely. Here is where the drawback of commercial canning makes itself felt. The machinery used in this work allows large quantities of soil and dust to be mixed intimately with the vegetables and in consequence a much higher temperature must be used to kill the resistant soil bacteria.

First we have carrots and beets, always in contact with the soil. It will be found useful to scrub the young carrots and beets with a brush to remove as much soil as possible. Then the carrots are scraped to remove the skin and the beets put in boiling water for five minutes, after which they peel easily. When the greatest cleanliness is exercised and the vegetables are perfectly sound they can be sterilized two consecutive days for 40 minutes, ohtrwise a third sterilization is necessary.

Rhubarb does not encourage the growth of bacteria, and one sterilization for 40 minutes is ample. Young peas and wax beans, if very clean, can be sterilized 2 consecutive days for 30 minutes, otherwise the first sterilization must last at least 40 minutes.

In Holland a very simple method is used generally for the preserving of wax beans, endives, spinach, purslane, etc. The beans are broken in one-inch pieces and put in small cheese cloth bag, each holding a souple of pounds. Then the beans are cooked for 20 minutes in a large pan with water and after they have cooled down, they are submerged in a salt brine of a pound of salt to a gallon of water. A stone crock is the best receptacle, and a stone weighing down a board will keep the vegetables well under the liquid. Moulds will appear on the surface of the brine and this layer should be skimmed off once a fortnight and the top board and stone cleaned carefully. A 5-gallon crock can hold a considerable quantity of way beans and will supply a large family throughout the winter. Spinach and purslane are treated the same way, but in case of endives the cheese cloth bags are superfluous, the whole heads being cooked for 20 minutes and submerged.

No mention has been made of the proper methods of handling the preserving jars before, during, and after sterilization, as detailed information on this subject has appeared repeadly in this Journal.

J. VANDERLECK

OF GENERAL INTEREST

MEAT IN HOT WEATHER

A Few Simple Precautions for the Housewife Who Does Not Want Her Supplies to Spoil—Condition of Refrigerator Important

A few simple precautions will aid the housewife in keeping meat untainted in hot weather. It is, of course, common knowledge that the higher the temperature, the quicker meat will spoil, but the family's supplies are not absolutely at the mercy of the thermometer. Ice and cleanliness are two great weapons of defense.

For many families a refrigerator is obviously out of the question, but it is perhaps better to have no refrigerator at all than a neglected one. Merely to wash it out occasionally does little good; it should be thoroughly scalded at frequent intervals, in particular the drain. This, if overlooked, is apt to harbor fungous growths, which may spread to the food. On one occasion a man applied to the department because he had found that a joint of beef placed in his refrigerator had turned a peculiar bright red. Upon examination it was ascertained that the meat was covered with a peculiar fungous growth due entirely to the condition of the refrigerator. Growths of this kind do not always advertise themselves so prominently and there may be much evil in an ice box that the eye can not detect.

If the refrigerator drain is not thoroughly cleaned, moreover, it is likely to become choked, the water is not carried off quickly enough and little pools are left standing in the interior. Dampness is one of the conditions most favorable to bacterial growth. An ice box in this state will not protect food long. It is, in fact, a wise precaution to wipe the interior of a refrigerator every day with a dry cloth.

The temperature of the average refrigerator is higher than most persons suppose, and in those households where a regular supply of ice is not obtained a cool cellar, a spring house, or the depths of a well may serve somewhat the same purpose. On farms where there is an ice house the meat may be placed in some form of closed retainer and buried in the ice. In any event, the meat must be carefully screened from flies. The danger from infection from these pests has been pointed out many times, but familiarity breeds contempt and they still persist. The fly not only does the meat itself no good, but it may readily deposit upon it some infection, which is carried in turn by the meat into the human system. Some flies will deposit their eggs on the meat and these in a short time will become maggots, and the meat is "flyblown."

Much sickness that is popularly ascribed to ptomaine poisoning or to bad food in general is really caused in some such way as this, the food, in itself perfectly wholesome, acting merely as a mechanical carrier for the "germs" which cause the trouble. Some of these sorts come from the human intestine, and their presence is a sure indication that filth is present, even if the amount is too small to be seen. Filth of this kind may be carried by dust, but it more often comes from soiled hands. One might wish that every kitchen could have the sign found in some well-managed food factories—"When you leave the room for any purpose, wash your hands before you return to work."

"Germs" which grow in foods and cause illness grow very rapidly, particularly if the food is a little warm, and are not destroyed unless the food is well cooked before serving. Simply "warming up" is not enough, as was found in a case of illness recently reported after eating some warmed-up creamed vegetable. Certain kinds of food—creamed chicken, or custard, or warm vegetables, for example — are excellent culture mediums for bacteria which may have been introduced into them by accident. For this reason it is a safe rule to have as short a time as possible intervene between the preparation of food and its consumption. Broth is another excellent medium and in consequence should be drained off if it is intended to keep the meat for any length of time before serving. If the broth is used also, it should be boiled thoroughly first. All food, cooked or uncooked, should be kept in a clean, cool place in order to reduce the danger of infection to a minimum.

When meat must for any reason be kept for unusually long periods of time, or when the conditions are unusually unfavorable, scalding may be resorted to advantageously. Dropping the meat into boiling water for a few minutes will not seriously affect its flavor when it ultimately appears upon the table, and it will put it in a much better condition for keeping. It is important, however, that it be dipped in a large body of boiling water. If only a small amount of water is used, the introduction of the meat will lower the temperature to such an extent that the whole process becomes worthless. With such meats as veal or pork, which are always—or ought always to be—thoroughly done, the precaution can be carried further and the joints partially cooked before being stored away. Care should be taken, however, to see that the recooking is thoroughly done.

Hot weather also calls for additional precautions on the part of the housewife in regard to canned products. Once these have been opened and exposed to the air they spoil as quickly, if not more quickly, than fresh food. The contents of a can should therefore be disposed of without delay. In no event should they be left in the can after it has been opened, but should be used at once unless the housekeeper wishes to "air" the canned material, which some believe is desirable. If this is done, the can contents should be transferred to a clean earthen or glass dish and put away for an hour or two in a cool place where dust will not reach it.—*Weekly News Letter, U. S. Department of Agriculture.*

PROTECT BUILDINGS FROM LIGHTNING

It is an old and doubtful saying that "lightning never strikes twice in the same place." When it does strike, however, it causes destruction and death. During the month of April, throughout central and eastern Ontario and western Quebec, no fewer than 61 buildings were destroyed or damaged by lightning. It is doubtful if any of these buildings were protected by lightning rods.

Isolated and exposed as they are to the danger of lightning, it seems remarkable that so few farm buildings are equipped with this cheap and efficient protection.

Lightning rods have proven their efficiency. Many buildings owe their protection entirely to the fact that they were rodded, and losses on these buildings have been reduced to a minimum. According to W. H. Day, Professor of Physics, of Ontario Agricultural College, "out of every thousand dollars' worth of damage done to unrodded buildings, by lightning, nine hundred and ninety-nine dollars' worth would be saved if those buildings were properly rodded." This opinion is based on data compiled from investigations and reports covering ten years and including a record of 599 buildings that were struck by lightning. Of these 317 were burned, or 53.6 per cent. Of the 599 buildings only 18 were rodded, and of these, three were burned, or 16.6 per cent as against 53.6.

When it is understood that the losses to the insurance companies in Canada by lightning approximate a half million dollars annually and that this represents probably less than half of the total loss, the necessity of more adequate protection to farm buildings is apparent.

Some records of lightning rod efficiency follow: In Ontario for 1912, 94½ per cent; for 1913, 92 per cent; in Iowa for eight years, 1905-1912, 98.7 per cent. In Michigan, inspected rods showed an efficiency of 99.9 per cent for four years, 1909-1912, inclusive. These figures are worthy of the careful consideration of the residents of the rural districts of Canada.

Further information on the subject of lightning rods and their efficiency may be obtained in Bulletin 220 of the Ontario Department of Agriculture, supplied free to those interested.

BEWARE OF FLIES

Flies are filthy insects. They drink from the cesspools, and dine in the privy vault. They eat the sputum on the sidewalk, and revel in the garbage pail.

Perhaps you think it is disgusting to read about such things, and so it is. But is it not more disgusting to have these same flies, after their repast of filth, drown in the milk pitcher, drop their specks on the frosted cake, or clean their feet on the bread? Is it pleasant to see the flies that very likely have just come from a neighboring privy, crawl over the lips of the sleeping baby, or gather on the nipple of its nursing bottle? Suppose the fly that was fished out of the milk pitcher had just been eating the excrement of a typhoid fever patient, would you like to drink the milk? Perhaps the flies that were walking on the fruit which you purchased at the street corner had just been feeding on the sputum of a consumptive. Does it not seem likely that flies may spread disease? That is what many physicians and health officers think.

Why not screen the house, and protect the food from flies?

The young of flies are maggots. They seem to prefer to breed in stable manure. But they also breed in excrement of all kinds, in garbage, and in all sorts of wet and filthy refuse.

Do you want to raise these filthy insects, these germ carriers, these indicators of untidiness, to be a pest in your own house, and perhaps carry disease to your neighbors? Of course you do not.

Then keep the stable manure closely covered and have it removed often, once a week in summer if possible. Keep the yard and the alley clean. Allow no refuse to accumulate anywhere. Fix the privy with screens so that it will be flyproof. After your own premises are in order talk over the matter with your neighbors, and get them also to read this circular.—*Health Dept., Boston, Mass.*

WEEDS ON VACANT LOTS

What undoubtedly constitutes a menace to those farmers who are making an honest effort to keep their farms clean is the crop of weeds found growing on vacant lots and roadsides in and around our towns and cities. These vacant lots are often nothing more nor less than nurseries and breeding places for all kinds of weeds. This is especially true of towns where large areas adjoining have been subject to wildcat subdivisioning and have had roadways ploughed, forming lodging places for weeds, which are allowed to grow unmolested. These produce countless numbers of seeds, to be blown and scattered by the winds over the farms. So far, bulletins, articles and advice pertaining to weed control have been directed at the farmer. A glance at the conditions found in most of our cities and towns will prove convincing that the farmer is not entirely to blame in the matter of weed seed production and distribution.

In the West the weed inspectors are being trained and instructed along lines that will enable them to assist the farmers in weed control. while at the same time provision by law is made to prevent any farmer from allowing his farm to become a breeding place for weeds and a menace to his neighbours. In most towns there are by-laws covering the weed problem but too often they are not enforced. Those living in towns and cities should co-operate and do their bit in the war against weeds. This is an important matter, and should receive strict attention by every town council. Action should be taken at once and not deferred until the weeds ripen and scatter their seeds.—F.C.N.

DEEP FALL PLOWING AND THE SEED BED

THE presence of heat, air, and moisture is essential to chemical and germ action in the preparation of plant food in the soil. The depths to which these penetrate the soil depend upon the depth of the plowing, provided the soil is well drained. There is no use plowing down into a subsoil full of water.

It has been proved beyond question that the roots of plants penetrate the soil deeper and feed deeper in deeply plowed land. Thus, in general, it may be stated that when the soil is plowed three inches deep the plants have three inches of food; when plowed six inches deep, they have six inches of food; and when plowed ten inches deep, they have ten inches of food. The fact that the bottom portions of the plowed land are not as rich in available plant food as the top portions shows the necessity of getting more air and heat down to them by deeper tillage.

The most essential condition for fertile soil is a constant supply of moisture, so that a film of water can envelop the soil particles and absorb nutritive elements. The hair roots of plants drink this for nourishment. If there is any more than enough to serve as films for the soil particles and capillary water, there is too much, and it should be drained off. This can be determined by digging a hole 20 inches deep. If there is standing water in the bottom of this hole it indicates too much water in the soil or subsoil.

The capacity of a given soil to hold film and capillary moisture depends upon how finely it is pulverized and upon the amount of humus in it. Unplowed lands retain but little water. Thoroughly pulverized soil three inches deep cannot store enough to make a crop.

In every year there are periods of drought, sometimes not serious, but generally sufficiently protracted to reduce the crop. The remedy for this is increased storage capacity for moisture. This can be accomplished by deep and thorough tillage and by filling the soil with humus (partly decayed vegetation). The effect of humus is to greatly increase the storage capacity of soils for water and to reduce evaporation. A pound of humus will store seven and one-half times as much moisture as a pound of sand, and the sand will lose its water by evaporation three and one-half times more rapidly than the humus. A clay soil will store only about one-fourth as much moisture as humus, and will lose it by evaporation twice as rapidly.

Plants use an enormous quantity of water. An acre of good corn will absorb and evaporate during its growth nearly ten inches of water. About three-fourths of this amount will be required during the last 75 days of its growth, or at the rate of two and two-fifths inches of water a month. This is in addition to evaporation from the soil, which, even with the retarding influence of a dust mulch, will amount to several inches each month in mid-summer. In case the land is plowed only three or four inches deep, though thoroughly pulverized, it will store an amount of moisture entirely insufficient to supply crop requirements in any protracted drought. These shallow and generally poorly prepared seed beds are the principal cause of the low corn yields in the south, and they affect the cotton yield similarly, but not so much, because cotton is a more drought-resisting plant than corn. If planting is done at all, it is folly to prepare a seed bed so shallow as to bring about the almost total loss of the crop some years, and a reduced crop every year.

Always plow in the fall; the earlier after the first of October the better. Every observant farmer has noted that seeds germinate more quickly and that plants grow more rapidly on fall breaking than on spring breaking. Fall plowing renders more plant food ready for use, while the preparation of the land in the fall saves work in the spring, when everything on the farm is crowding. In plowed land the loss of plant food is less than in unplowed land; more plant food may be produced and more can be stored.

An objection is sometimes urged that fall-plowed soil becomes saturated with water during the winter and remains wetter and colder later in the spring than land left unbroken in the fall. This is true only upon land not sufficiently drained and where the breaking is shallow. Water passes through deep breaking rapidly, and with reasonable drainage it is ready for planting earlier than lands broken in the spring.

The advice to go down gradually is given solely because the inexperienced farmer may try to plow too deeply the first time and bring to the surface too much of the subsoil. The best plan is to double plow; that is, to follow the breaking plow in the same furrow with a narrower plow or a scooter (with sides removed) and go down as deeply as desired. Generally the disk plow may be sent down eight or ten inches with impunity if the plowing is done in the fall, and especially if the land is plowed twice or more.

There is no question that breaking and pulverizing to a depth of eight to ten or twelve inches is economical. The cost of breaking ten inches deep when done with a disk plow should not be more than 50 cents an acre in excess of breaking six inches deep. Whether a plant has plenty of food all the time or only part of the time makes the difference between a good crop and a poor crop.

In case no winter cover crop is used the soil should be disked or harrowed two or three times during the winter, provided it is dry enough. Give good drainage to all parts of the field.

Any cultivation done after the deep fall breaking should be shallow — not more than three or four inches deep.

—*Exchange*

THE FARM EQUIPMENT

IN speaking or thinking of items of farm equipment, the average farmer will always call to mind the larger items of farm equipment, such as the implements and machinery employed in the doing of the farm work. The small tools needed on the farm, and which are to be found on the well-equipped farm, will scarcely ever come to his mind in this connection. This point was forcibly brought out by some work recently done by the Ohio Experiment Station in co-operation with the United States Department of Agriculture. In order to arrive at some definite conclusion in this matter, careful inventories were taken on 33 Ohio farms, and in each case the owners were asked to estimate the value of the small tools included in the farm equipment. In practically every case the actual value of the small tools to be found upon the well-equipped farm exceeded the "guess" of the farmer very largely, being greater by about 500 per cent on the average than the estimate placed on them by the owners. It was found that the value of the equipment which was included under the term of "small tools" would cost from $200 to $300 on the average Ohio farm. An interesting phase of this investigation was the fact that upon farms where inventories are regularly taken these tools were generally bunched under the head of "other small tools" and given an estimated value far below their actual value, either from the standpoint of cost or their value in the operation of the farm.

In the result of this investigation there would seem to be a valuable lesson for the average reader. It seems to indicate that the average farmer has a very dim conception regarding the actual equipment of his farm in this regard. If this is as universally true as it appears to have been upon the Ohio farms investigated, it would certainly be a good thing for the average farmer to take stock of the "small tools" to be found upon his farm, and then to study the proposition carefully to determine whether his equipment in this line is adequate to his needs. Obviously it is good business sense to have a sufficient equipment of these small tools to enable the workmen employed to accomplish the work to be done with the greatest possible degree of despatch and efficiency. It is undoubtedly a matter of economy to have a sufficient supply of forks, shovels, spades, hoes, saws, axes, planters, and other small hand tools of a similar character to have the proper tool for the work always at hand, and thus avoid the necessity of borrowing from the neighbors or making trips to town in the busy season to supply the deficiency as the particular tool happens to be needed, or else handicap the workman by compelling him to use a tool not adapted to the purpose in hand. In like manner there should be at hand the more common of the small tools frequently needed in making repairs to these same tools or to implements, machinery or harness, in order that expensive delays may be avoided and valuable time saved. Concrete illustrations might be given to cover a multitude of cases to which this advice would apply. But the farmer who takes this subject up in a thoughtful and thorough manner will be able to establish the connection between trivial needs of this kind, from the standpoint of the investment required, and the expensive result brought about indirectly by that need, as the poet has established the connection between the lack of a horse-shoe nail and the loss of a history-making battle.

Then, from another standpoint, this is an important subject for consideration upon the average farm. The very considerable cost of the needed equipment of small tools on the farm should give to this item of overhead expense a significance which is too often not accorded it upon the average farm. Not only should the needed small tools be at hand, but they should be of a quality which will make them efficient and lasting in service. They should also receive a degree of good care which will keep them always in condition for the most effective work. Then they should be systematically stored in convenient proximity to the places where they are most often needed, so as to avoid a waste of time in gettting them and replacing them after they have been used. In fact, there is ample room for careful thought and study in this matter of the equipment of the farm with small tools in a suitable and economical manner. Something in this connection will depend on the line of farming followed, but most of us follow diversified farming, and the greater the diversity of our production the greater the need of considering this problem, for the greater will be our need of a proper assortment of small tools which go to make up the equipment of the well managed farm.

—*Michigan Farmer*

COTTONSEED RATIONS THAT SUPPLY CHEAP AND VALUABLE PROTEIN AND FAT

TWENTY per cent of our cottonseed meal was consumed last season by Germany, Denmark, Switzerland, and other European countries. The present war, however, has abolished the German consumption of this product. This fact, together with the large cotton crop produced this year, has thrown an excess of cottonseed products on the home market, reducing the average price of cottonseed meal and hulls 20 to 25 per cent. The meal shipped to Europe last year would feed 400,000 head of mature cattle for 12 months.

Even under ordinary circumstances, with the price of cottonseed products at their high-water mark, according to the specialists in animal feeding of the department, the meal is the cheapest nitrogenous feed available. Pound for pound, cottonseed meal contains three times the per cent of protein contained in wheat (grain), wheat bran, wheat middlings, vetch hay, alfalfa hay, soy bean hay, or crimson-clover hay, and four times the quantity of fat found in any of these foodstuffs. About 88 per cent of the protein in high-grade cottonseed meal is digested by the animal, or, in other words, the digestive coefficient of the protein in the meal is 88 per cent. The digestive coefficient of corn meal is only 68 per cent, and it does not contain one-fourth the actual amount of digestible protein found in cottonseed meal.

Comparing the cost of digestible protein in a pound of cottonseed meal with that in other feeds, and assuming the average delivered cost of cottonseed meal to be $24 per ton, the figures show that the feeder gets two to five times as much protein for his money from cottonseed meal as from other feeds. The following table shows the relative cost of protein in cottonseed meal and other forms of feed:

	Cost per ton.	Per cent digestible protein.	Cost in cents per pound of protein.
Cottonseed meal . . .	$24.00	34.00	3.52
Ground oats	32.00	9.50	17.00
Corn meal	32.00	8.00	20.00
Wheat bran	26.00	12.50	10.00
Dried brewers' grain. .	26.00	15.50	8.40
Buckwheat middlings...	26.00	22.00	6.00
Gluten feed.	30.00	23.00	6.50
Linseed meal	40.00	32.00	6.30

In addition, an average of about 85 per cent of the fertilizing value of the nitrogen remains in the manure.

In the past we have imported a large per cent of our nitrates for commercial fertilizer, and these importations will be cut down on account of the war. The value of cottonseed meal will therefore be still more obvious in the spring, when the demand for fertilizers begins.

A few specimen rations containing cottonseed products are given as an illustration of the use that may be made of these feeds. The actual amounts will vary, of course, as the appetite of the animal and judgment of the feeder may determine, and as other feeds are combined in the ration. The proportions stated are correct for ordinary conditions, and with reasonable care in feeding rations of this kind will be found both satisfactory and economical.

Amount of feed per 1,000 pounds of live weight

FOR FATTENING CATTLE

Ration No. 1:

10 pounds corn.
4 pounds cottonseed meal.
10 pounds cottonseed hulls.
20 pounds silage.

Ration No. 2:

6 pounds cottonseed meal.
27 pounds cottonseed hulls.

FOR GROWING BEEF CATTLE

Ration No. 1:

6 pounds corn.
3 pounds cottonseed meal.
4 pounds wheat bran.
10 pounds cottonseed hulls or sorghum hay.
25 pounds silage.

Ration No. 2:

6 pounds corn.
3½ pounds cottonseed meal.
10 pounds clover or alfalfa hay.
30 pounds silage.

FOR MILCH COWS

Ration No. 1:

35 pounds silage — corn, milo maize, kafir corn or sugar cane.
10 pounds cured roughage—corn without ears or hay from grasses exclusive of legumes.
4 pounds wheat bran.
4 pounds cottonseed meal.

Ration No. 2:

35 pounds silage.
10 pounds leguminous hay — clover, alfalfa, cow peas or soya beans.
6 pounds wheat bran.
2 pounds cottonseed meal.

FOR WORK HORSES AND MULES

Ration No. 1:

9 pounds corn.
2 pounds cottonseed meal.
12 pounds prairie hay.

Ration No. 2:

8 pounds rice bran.
4 pounds molasses.
2 pounds cottonseed meal.
12 pounds prairie hay.

FOR GROWING HORSES AND MULES

Ration No. 1:

6 pounds corn.
2 pounds cottonseed meal.
12 pounds prairie hay.

Ration No. 2:

3 pounds corn.
3 pounds wheat bran.
2 pounds cottonseed meal.
14 pounds sorghum hay.

Amount of feed per 100 pounds of live weight

FOR FATTENING SHEEP

Ration No. 1:

2 pounds corn.
½ pound cottonseed meal.
1½ pounds prairie hay.

Ration No. 2:

1 pound black strap molasses.
½ pound cottonseed meal.
3 pounds cottonseed hulls.

FOR GROWING SHEEP

Suggested ration:

1-3 pound corn.
1-3 pound cottonseed meal.
1-3 pound wheat bran.
2 pounds prairie hay.
2 pounds silage or roots.

Growing sheep to be kept in condition should have about 2 pounds of silage or roots, or similar food, in their ration.

If cottonseed hulls and meal can not be bought in the local markets any cottonseed oil mill or broker will supply these products. The meal is generally marketed in sacks of 100 pounds. The usual carload consists of 300 to 400 of these sacks. The hulls can be bought in 100-pound bales or sacks, or can be bought cheaper loose in bulk. A carload varies from 12 to 20 tons. If desired, these products may be shipped in the same car by putting the sacked meal on top of the loose hulls.—*Weekly News Letter, U. S. Dept. Agr.*

OIL-MIXED CONCRETE

Experiments in the Department of Agriculture Demonstrate Its Value in Many Kinds of Buildings

AFTER extensive laboratory and service tests the U. S. Department of Agriculture has secured results which appear to establish definitely the value of oil-mixed concrete for damp-proof construction. Detailed results of these tests, which were carried out in connection with the work of the Office of Public Roads, are contained in the new bulletin, No. 230, of the department, entitled "Oil-Mixed Portland Cement Concrete." Briefly summarized, the conclusions to be drawn from them are that the admixture of certain mineral oils in small proportions, not to exceed 10 per cent of cement used, does not lessen the tensile strength of mortar; that the decrease in the compressive strength of mortar and concrete is not serious; that concrete mixed with oil takes much longer to set hard, perhaps twice as long, but that the increase in strength is nearly as rapid in the oil-mixed material as in the plain concrete. The use of oil does not make the concrete impervious to heavy water pressure, but it does make it practically nonabsorbent under low heads.

The value of oil-mixed concrete is said to be particularly great in the construction of basement floors and walls, watering troughs, cisterns, barns, silos, and in all parts of concrete structures that are to be made damp proof.

The oil should in no case exceed 10 per cent of the weight of the cement, and for the most part 5 per cent is all that is necessary. Since a bag of cement weighs 94 pounds, 4.7 pounds of oil, or about 2½ quarts, should be added for each bag of cement used in the mixture. The sand and cement should be first mixed with the proper amount of water into a stiff mortar, to which is added the correct amount of oil, and the whole mass again thoroughly mixed until all traces of oil have disappeared. Particular care should be taken to insure that the oil is thoroughly incorporated in the mixture, and the time of mixing should be practically double that when the oil is not used. For this reason a continuous mixer should not be used in oil-cement-concrete work, as it is difficult with this type of machine to increase the time of mixing sufficiently.

The kind of oil is also important, and the following technical specifications are suggested in the bulletin in order to prevent the use of certain oils which might tend to impair the strength of the mortar or the concrete.

(1) The oil shall be a fluid petroleum product and shall contain no admixture of fatty or vegetable oils.

(2) It shall have a specific gravity not greater than 0.945 at a temperature of 25°C.

(3) It shall show a flash point of not less than 150°C. by the closed-cup method.

(4) When 240 cc. of the oil is heated in an Engler viscosimeter to 50°C., and maintained at that temperature for at least three minutes, the first 100 cc. which flows out shall show a specific viscosity of not less than 15 nor more than 30.

(5) When 1 part of the oil is shaken up with 2 parts of hundredth normal caustic soda there shall be no emulsification, and upon allowing the mixture to remain quiet the two components shall rapidly separate in distinct layers.

For practical use the addition of oil will be found particularly useful in the construction of basement floors and walls. Many of these now in existence are continually damp, and such a condition may be remedied by the application of an oil-mixed mortar coat to the old surface. A mortar composed of 1 part of cement and 2 parts sand and containing 5 per cent of oil should be sufficiently nonabsorbent for this purpose.

Watering troughs and cisterns made of oil-mixed concrete should also prove of considerable practical value in the conservation of water. In the construction of barns, where oil-mixed concrete is used, the interior will be noticeably drier than when ordinary concrete is used. Owing to their durability, cleanliness, and resistance to fire, concrete barns are becoming more and more popular, but they suffer from the disadvantage that during a long beating rain the side walls are inclined to absorb much moisture, which ultimately penetrates into the interior. The addition of oil to the extent of 5 per cent of the weight of cement in the concrete used in the side walls obviates this objection. Barn floors can also be constructed in the same way with advantage. A damp-proof floor is warmer because of the lack of evaporation from its surface, and it is also more sanitary than an ordinary concrete floor because of its nonabsorbent character.

There are, of course, any number of other types of buildings and structures of all sorts in which oil-mixed concrete may be used advantageously, or, if this is not necessary, a coat of oil-mixed mortar may be applied effectively.

Attention is called, however, to the fact that extreme care in proportioning, mixing, and placing the concrete is absolutely necessary if the addition of any waterproofing agent is to be of value. The process of mixing oil with concrete has been covered by a public patent, so that any one is at liberty to use it. The methods of using this material are discussed more fully in the bulletin already mentioned.

LEADERS IN COUNTRY COMMUNITIES

MAKE the farm as profitable as we may, we cannot realize returns sufficient to hold there the ambitious boy whose one aim is to accumulate vast riches. True, there may be exceptions to this rule, but it applies in a very large percentage of cases. The country makes, in the main, neither millionaires nor mendicants, but it is a great place for the development of men. It is in the cities that the financial gulf is wide. There we find wealth and want. There is the chance to become a millionaire—yes, and the danger of becoming a mere cog in a machine. Yet, unafraid, the fortune-seeker leaves the farm.

Not every country-born boy should remain in the country. The city needs many of these lads fresh from the life-giving, brain-and-brawn-building land, but for the country's good—and the nation's, too—the drain has been too heavy.

The most lamentable lack of country life is leadership. So it is of prime importance that a fair proportion of the youth who may become leaders remain in rural communities. How is this desirable end to be brought about? Largely by holding up to the ambitious farm boy the right kind of ideals and getting in his mind the best ideas, by giving to him a vision filled with the proper attitude toward work and the world, by making it possible for him to see in farm work more than dirt and drudgery. The worker must see in his daily duties tasks worthy of his talents. Herein lies the strength of our schools, and of teaching and research work in agriculture. Science is valuable not alone for the limited mastery it has given to man over the soil, growing plants and animal life with which he daily comes in contact, but it serves also to enable him to see in these things interest, possibilities, power and a field for unlimited research.

So with farming made sufficiently remunerative as to give to its followers reasonable returns with interest quickened, and success properly defined, we may, without the possibility of great riches for the many, see fewer country-born boys turn to the city.

Breeders' Gazette

The "every purpose" Ammunition-

For every popular gun — every kind of game —every shooting purpose — there's a Dominion load of a size and power that's exactly right.

Five kinds of shot shells in all standard gauges.

More than a hundred different metallics — from BB Caps to high power sporting cartridges. All powders used are standard — black and smokeless — (Lesmok in 22's.)

Materials and manufacturing methods are 100% perfect. The system of inspection and testing is rigid and accurate. Guaranteed dependability is the result.

"The Ammunition made wholly in Canada." Sold everywhere.

Dominion Cartridge Co., Limited,
861 TRANSPORTATION BUILDING,
MONTREAL.

Shoot Dominion Shot Shells & Metallics

TO ALL SUBSCRIBERS

OF

The Journal of Agriculture

the management of "Le Canada" offers yearly subscription of its Weekly Edition, at the special price of

50 cents

This advantageous offer will last only till the 1st of October next.

The Weekly Edition of "Le Canada" is published every Thursday, at 12 pages and contains a recapitulation of all the news of the war and the most important events of the week.

Would be pleased to mail a copy upon request.

CANADA PUBLISHING CO. 75 St. James St., Montreal

[illegible]
SEP [illegible]

The JOURNAL of AGRICULTURE

AND HORTICULTURE

Volume 19 September 1st 1915 Number 3

A BIRD FIT FOR THE EXHIBITION.

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

GRAND PRIZE

PANAMA-PACIFIC EXPOSITION

Awarded to

DE LAVAL

CREAM SEPARATORS

as the Highest Award has been at every International Exposition since the invention of the Centrifugal Cream Separator in 1878.

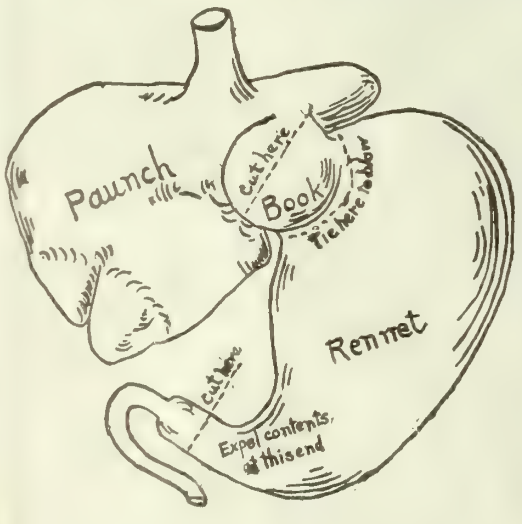
And likewise as at all previous expositions, all higher dairy product awards at San Francisco have been made to users of the De Laval machines.

DE LAVAL DAIRY SUPPLY Co., LIMITED

MONTREAL PETERBORO WINNIPEG VANCOUVER

50,000 BRANCHES AND LOCAL AGENCIES THE WORLD OVER

WANTED-- CALF RENNETS



Owing to the war in Europe the supply of foreign rennets has been reduced and domestic rennets are in demand.

Farmers will find it profitable to save calf stomachs and Butchers and Commission Dealers can add a paying line to their business by collecting and shipping the cured pieces. We are in the market at all times for calf rennets either dried or salted and invite correspondence.

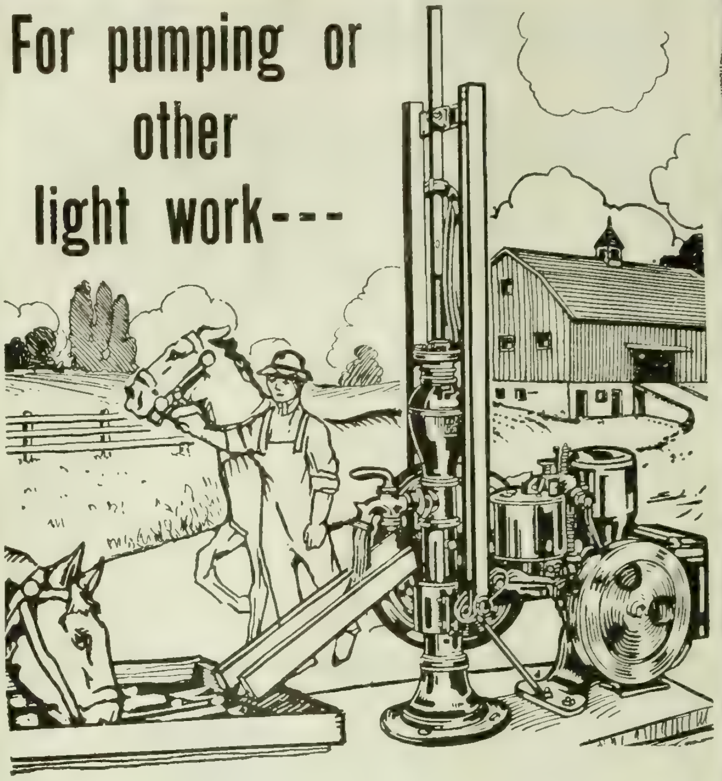
CHR. HANSEN'S LABORATORY, INC.

Little Falls, N. Y. U. S. A.

Manufacturers of

Chr. Hansen's Danish Rennet Extract, Danish Butter Color, and Danish Cheese Color. Lactic Ferment culture for ripening Cream in Butter Making and Milk in Cheese Making. Rennet Tablets and Cheese Color Tablets for Farm Cheese Making.

For pumping or other light work---



the engine you need is a

Fairbanks-Morse Eclipse

It cuts chore time in two and eats up the bigger half.

The Eclipse is a healthy, husky little engine that can do a lot of good hard work. It can be moved easily from place to place, and put to work pumping, grinding, hoisting — dozens of jobs — and it's ready in a few minutes.

Every element of the perfect farm engine is built into the Eclipse. It is simple, powerful and durable.

And economy is a very strong point—the original cost is low ($48.00 without the pump, f.o.b. Toronto factory), fuel consumption is light and the cost of up-keep is practically nothing. Repairs are few and far between.

Everything is explained fully in "Power on the Farm," an interesting booklet, which will be sent free immediately upon request. Address:

17 Fairbanks-Morse Building (any branch).

The Canadian Fairbanks-Morse Company Limited

CFM

MONTREAL OTTAWA TORONTO
ST. JOHN QUEBEC WINNIPEG
HAMILTON CALGARY SASKATOON VANCOUVER

CANADA'S DEPARTMENTAL HOUSE FOR MECHANICAL GOODS

YEARLY SUBSCRIPTION TO THE "JOURNAL OF AGRICULTURE" IS **ONLY $1.00.** IT IS WORTH TEN TIMES THAT AMOUNT TO THE FARMERS' HOME.

Butter and Cheese factory

FOR SALE, situated at 4½ miles from the nearest factories. 35 patrons, in good order. $2,500.00 — $1,000 cash and $150.00 yearly, without interest. These terms will be accepted in account of bad health. For further information, apply to Mr. E. A. THERIEN, R.R. No. 2, South Stuckley, P.Q.

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 97,657
ENGLISH, 9,820
FRENCH, 87,837

Volume 19 SEPTEMBER 1st 1915 Number 3

EDITORIAL

DEPARTMENT OF AGRICULTURE

Auction Sale of Breeding Stock by the "General Stock Breeders' Association of the Province of Quebec" under the patronage and with the help of the Department of Agriculture of Quebec

Quebec, August 15th 1915.

Sir,

THE General Stock Breeders' Association of the Province of Quebec will make its sixth annual sale of registered cattle, swine and sheep at Montreal, at the Delorimier Park, at 10 a. m., on Wednesday, 13th of October, 1915, and at Quebec, at the Exhibition grounds, at 10 a. m., on Wednesday, 20th October, 1915. The sale will be made for cash, except for Farmers' Clubs and Agricultural Societies, which will be entitled to the following delays:—Clubs buying for $50.00 or less will pay on the first of November, 1916, and any Clubs buying for more than $50.00 will pay one half the amount of the purchase on the first of November, 1916, and the other half one year later. However a Club buying or borrowing cannot contract debts for any higher amount than $250.00. Agricultural Societies buying for $300.00 will pay on the first of November, 1916 and those buying for a larger amount will pay one half on the first of November, 1916, and the other half one year after, without interest, but with interest after the payments are due.

This sale will be made subject to the following conditions: 1. The purchaser will be bound to keep the animals bought for breeding purposes in the province of Quebec for two years; 2. to keep and feed these animals with care; 3. to sign a contract relative to the sale with the department of Agriculture. The latter may retain the price out of the grants to be paid to the Clubs or Agricultural Societies.

The Honourable Minister of Agriculture hopes that the Farmers' Clubs and the Agricultural Societies will take advantage of this sale in order to purchase choice breeding animals.

These animals have been selected by experts from the herds of the best breeders. The cattle offered for sale will be of the following breeds: Canadian, Ayrshire and Holstein. The sheep offered for sale will be of the following breeds: Leicester, Cotswold, Lincoln, Shropshire, Hampshire and Oxford. The breeds of the swine offered for sale will be Yorkshire, Berkshire, Chester, Tamworth.

The cattle shall have been submitted to the "Tuberculine test".

The person authorized to buy should bring a copy of the resolution giving him the power to do so.

Yours truly,

J.-ANTONIO GRENIER,

Acting Deputy Minister of Agriculture

THE 1915 HARVEST

IT is now fairly certain that the 1915 Canadian harvest is a bounteous one in most of the provinces, and exceeds that of any previous one in its history. Some set-backs have been noted in certain districts, such as cutworms in spring, drought in July in some localities and excessive rains in others, grasshoppers in August, and rust and smut in wheat and oat fields, but the amount of damage has not been very serious.

The garnering of a big harvest at this time of stress is of great importance for the Empire. So long as the sea highway remains clear for British ships, and we see no reason for believing that the British Navy will not be equal to its task until the end of the war, the people at the heart of the empire will not suffer for lack of food supplies, even if the usual amount of wheat is not supplied by Russia.

Should the war last one or two years longer we believe that Canada will play a still greater part than she has already done in determining the result. A nation of eight millions, endowed with splendid resources of fertile lands, timber and minerals, with unequalled transportation facilities by land and water, and with great water and electric powers, is one that can be of great value in emergencies.

SEPTEMBER THE MONTH OF FAIRS

SEPTEMBER is a period of relaxation on the majority of farms after the rather strenuous weeks of haying and harvest. In October again the corn, roots and apples must be harvested and disposed of. The farmer has, therefore, some spare days in September which he can spend to advantage at the fairs. He should if possible attend a good provincial fair where the best exhibits are to be found, and the local county or district fair where the local exhibits come into competition.

During the last few years more emphasis has been given to the educational feature of fairs. This is most commendable and justifies the grant received from the Government. In many cases the judges are required to assign reasons for the placing of the awards, and encouragement is given to exhibits of a purely informational character, with men in charge to give any explanations necessary for their understanding. A close inspection of such exhibits is usually of great value to the farmer.

Most visitors to fairs desire amusement as well as information, consequently amusement features are provided. Sometimes, however, these features are not entirely free from objection; some are actually corrupting and degrading to the young men and women who attend. Fair officials cannot be too strict in this matter, and every precaution should be taken to cast out all semblance of unseemly features.

IMPORTANCE OF STABLE VENTILATION

AS we visit district after district of this province we see many indications of a change of attitude regarding the ventilation of stables. A few years ago the prevailing idea was to make the stable as warm as possible but to pay no attention to the air the animals breathe. In most cases, therefore, the air of the stable was very bad, and the animals suffered accordingly. Tuberculosis became very prevalent, mainly because the animals became so reduced in vitality by the continuous breathing of vitiated air that they were unable to withstand the attacks of the germs.

We note with satisfaction the greatly increased attention that is being given to this very important matter by the stockmen of the province. Everywhere we go we find stables being overhauled and some system of ventilation introduced. The stockmen are convinced that a ventilated stable is a paying proposition because it conserves the health of the stock.

In another column an article appears dealing with the two common systems of ventilation in use in Canada, to which we beg to refer our readers. September is a good month to make the necessary changes if they have not already been done. The cost is by no means prohibitive, and the results will certainly show the wisdom of providing fresh air at all times for the stock.

FARM MANAGEMENT

AS we travel about the country and visit the different farms we are forced to the conclusion that *farm management* is a very important factor in successful farming. It is strange, but it is true nevertheless, that many farmers farm rather by imitating some neighbor than by skill in the use of methods obtained through a knowledge of underlying principles. In other words, the management of many farms is based on sight rather than reason. The veteran editor of Hoard's Dairyman has truly said "Show us a farmer who is trying to look into the reason of things and we will show you a man who will grow in ability every day of his experience. It takes that kind of a man to be a successful farm manager."

A man may know a great deal about the growing of crops and the breeding of animals, but he may fail lamentably if he is not able to arrange the work of his farm properly or to utilize to the best advantage the hundred and one minor details that arise in the course of the season. All this implies careful attention to both large and small matters, which in turn demands intelligence and thoughtful reasoning.

In these days of war we know that the successful captain or colonel is the man who knows what he is doing after careful preparation and acts at the

CONTENTS

EDITORIAL.—Auction sale of breeding stock by the General Stock Breeders' Association.—The 1915 Harvest. — September, the Month of Fairs.—Importance of Stable Ventilation.—Farm Management. — A New Departure in Teacher Training.—The Rural School House.—Science in Agriculture.

ORCHARD AND GARDEN.—The Market Problem.—Attractive Packages and Pack.—Hints for September.—Cucumber Wilt.—Packing Apples really an Art.—Forest Fires.—The Killing of Plant Tissue by Low Temperature.

FARM AND FARM CROPS.—Making Silage.—Roots.—After Harvest Cultivation.—How to make Whitewash.—Why Silage Moulds.—Air in Water Pipe.—Concrete Foundations for Farm Engines. — Killing Flies with Hellebore. — Quebec Fairs, 1915.—Silo insures the Corn Crop.

LIVE STOCK.—Local Sales of Pure Bred Sheep and Market Lambs. — Some Flocks, Herds and Farms of the Bedford District.—Stable Ventilation. — Official Records of Holstein Friesian Cows.—Milking Records of Pure Bred Cows.—Auction Sale.

DAIRY.—The Manus Milking Machine.—Producing City Milk Profitably.—The Improvement of Creamery Butter in Quebec.

POULTRY.—Officers of the American Association of Instructors and Investigators in Poultry Husbandry.—Looking Forward. — Egg Circles in Quebec.—Preserving Eggs for Winter Use.—Provide Shade for your Poultry.—General Purpose Fowls for Quebec.—Mils for Chickens.

WOMAN'S WORLD.—Foods and Food Preparation—Lesson XVIII.—The Children's Homer.—The Founder of Modern Nursing.—Alfalfa for Dairy Profits.—Hydrated Lime.

GENERAL INTEREST.—For Cheaper Milk.—Value of Liquid Manure.—The Origin of the Tomato.—The Need of Statistical Investigations.—Eliminate the Fly.—A Separator with three Cows.—Conservation of Soil Moisture.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

proper time. So it is with the sucessful farm manager.

While a good manager is frequently born—not made—yet many a made manager becomes a success by proper preparation. We are pleased to note that considerable attention is being given to the study of the principles and methods of farm management at our Agricultural Colleges. Such teaching is bound to have a deep influence on the agriculture of to-morrow. A farm well managed is likely to be well tilled.

A NEW DEPARTURE IN TEACHER TRAINING

FOR the first time a Summer course of four weeks in Nature Study and Elementary Agriculture was given at Macdonald College for Protestant teachers of the rural schools of Quebec. The object of the course was to prepare teachers for the introduction of these subjects into the schools, as provided for recently by the Council of Public Instruction. About 88 teachers were in attendance. The course were made as practical as possible by means of lectures and practical work in the field and laboratory.

For some time it has been felt that the instruction in our rural schools did not meet the requirements of the community. Pupils left schools without a knowledge of the common things—the weeds, the common trees and plants, the insects, the farm animals and crops, the soil, etc., with which they must necessarily come into direct relationship in actual farm work. It was felt that if rural life were to be made more satisfying and attractive more attention must be given in school to those things which constitute the environment. It has been shown in other provinces and countries that these studies are as suitable for purposes of mental training as the older subjects of the course, and often more interesting since they deal with things that are fundamentally part of the children's lives.

It is believed, moreover, that a knowledge of fundamental principles of agriculture acquired at school through these studies will be of great value in the introduction of scientific agriculture on the farms of this province.

THE RURAL SCHOOL HOUSE

PERHAPS it is a trifle late to discuss the question of the condition of school houses for the coming school year. When this number of the "Journal of Agriculture" reaches our readers the children will be back again at school, but we trust that the school has been put into fit condition for the children who are to study there for six hours a day for the next eight, nine or ten months.

Are the sanitary arrangements such as they should be? Are the out-houses clean and free from any objectionable features? If not, they should be attended to at once, for much harm may result which cannot be easily remedied.

Are the heating and ventilating systems satisfactory and up-to-date? Most school-houses are notoriously bad in these two very essential features. It is neither a difficult nor a costly matter to put in satisfactory systems, but it is a serious matter to allow the children to live in poorly heated and poorly ventilated rooms.

Are the blackboards good and in their proper location? Many a child's eye-sight is ruined by badly placed blackboards, which are hard to see and which blind the eyes.

Are the seats and desks adapted to the different sizes of the children? It is an easy matter to deform the spines of growing children by having them sit for hours at desks unsuited to their size.

Are the school surroundings as attractive as those of the home? Why should they not be? As a rule the school grounds are about the most unattractive spot in the neighborhood, without trees or shrubs and sometimes without a fence.

Finally, is the school presided over by a good teacher who has the interests of the children at heart and who is in sympathy with the life of the neighborhood? If not, get one who is, even if the salary is much higher. We believe a good teacher is the most valuable asset of a community. To the teacher are committed the children during the most impressionable years of their lives, and their future is largely determined at school. What are horses and cattle, valuable as they are, compared to children? We believe also that if the mothers of the neighborhood had more to do with the direct governance of the school its condition would be vastly improved. This is a field of work where the Women's Clubs can give valuable assistance. They have taken action already in some districts, and we look hopefully for their active interest in all sections. The welfare of schools is intimately related to the well being of the community; for this reason the Journal of Agriculture stands ready to help as well as to critize in a friendly way.

SCIENCE AND AGRICULTURE

THERE are many farmers who poke fun at the scientific man who is trying to help agriculture, and at the "scientific" farmer. They assert that agriculture has nothing to learn from science, and they are quite content, they say, to go along the old lines.

Let us see now whether their assertions are correct. Smut disease is very prevalent this season in oat fields where untreated seed was planted, but is quite scarce in fields where treated seed was planted. This loss will amount to 15 or even 20 per cent of the crop. Who devised the method of treatment? — The scientific man. Who devised methods of spraying fruit trees and potatoes against insects and fungous disease? Again the scientific man.

Who gave us the information regarding the importance of clover and other leguminous crops in maintaining the supply of nitrogen in the soil, and who furnished the information we now possess regarding *fertilizers*? Again, the scientific man. Who made the wonderful discovery regarding the part played by bacteria in dairying, in canning, in the keeping of food products? Who gave us knowledge of many of the diseases of live stock, so that we are able to guard the health of our animals? Again, the scientific man.

Who worked out practical systems of ventilation in barns and houses, and who made the wonderful improvements in farm machinery? Again, the scientific man. Who gave us the Babcock test? A scientific man. Who has given the improved breeds of cattle, the improved strains of grains? The scientific man.

And so we might continue our list of contributions of science to agriculture, in fact there is not a single department of agriculture that has not been greatly benefitted by science, and yet there are men who have no use for science! Every number of this paper contains contributions from science to agriculture. Present day farming is largely the application of scientific methods to agriculture.

One important lesson we may draw from the foregoing remarks.—The average farmer can become a scientific farmer by intelligent reading of the best agricultural papers and bulletins. "The art of farming we learn with our hands; the science of agriculture we must learn from the investigations of men of science."

"As a matter of fact," said the lawyer for the defendant, trying to be sarcastic, "you were scared half to death and don't know whether it was a motor car or something resembling a motor car that hit you." "It resembled one all right," the plaintiff made answer. "I was forcibly struck by the resemblance."—*London Tit-Bits.*

THE GARDEN AND ORCHARD

THE MARKET PROBLEM

By Fred H. Grindley, B.S.A., Assistant to the Fruit Commissioner, Ottawa

THERE is a very natural uncertainty existing among the fruit growers at present as to what will be the state of the markets during the heavy shipping period in the late summer and autumn. The general feeling is rather a pessimistic one. The European war seems to have impressed fruit shippers with the idea that the consuming public will eat very little fruit, that only staple necessities will be in great demand and that consequently the possibility of remunerative returns is a small one.

As a matter of fact those who are best in a position to hazard a forecast upon these matters strongly oppose the idea of any such situation arising. Trade Commissioners and large fruit importers in England and Scotland are of the opinion that a good demand at fair prices will prevail for fruit of sound and reliable quality. This assumption is based, first, upon the fact that there has been a moderate demand in England for the early and more expensive fruits, which are not as much a necessity of diet as apples; and, secondly, because there is now in England plenty of available employment for the labouring classes at good wages.

Fruit growers in Canada have already marketed large quantities of small fruits, and prices have been very satisfactory. It may, therefore, be assumed that our home markets will offer an equal, and, probably, a greater demand for the heavier shipments of apples, peaches and pears towards the end of the summer. There is also the promise of a large grain crop in the west, which will tend to bring about a free circulation of money. Thus we have in Canada the same two conditions upon which the optimism of authorities in Great Britain is based.

So much for supply and demand. The most obvious difficulty lies in the uncertainty of ocean transportation facilities being satisfactory. In 1814 there was, at times, an extreme scarcity of space on vessels plying between Canadian ports and Great Britain, with the result that many of the early varieties of apples could not be exported and were, in some instances, left to waste in the orchards. As long as the war continues that danger will be present, and will be the one to be most considered. So far as demand is concerned, or the purchasing power of the public, there is no indication of any reduction taking place. The average citizen has passed the "panic" stage and is not as much inclined to restrict or limit his purchases as he was at the first outbreak of war.

This branch will keep in touch with the large shipping companies and advise fruit shippers, as frequently as possible, regarding the dates of sailings and the space available for cargo.

ATTRACTIVE PACKAGES AND PACK

WHILE quality is an essential requirement in the marketing of any farm and fruit product, it is by no means the only factor in selling at the highest price.

First of all, the package used should be new and clean. The neater the package, the better the fruit will appear. While the products packed should be of uniform size and color throughout the package, the top layer should be arranged so as to attract the eye of the buyer. Further the package should in every instance be well filled. The buyer is very quick to notice shortness in measure, or any deficiency in a well-topped or rounded finish. In small fruit, such as the strawberry, particular attention should be given to have every berry in perfect condition, with the calyx or hull attached. The individual fruits should not be arranged in layers in the box nor should the top be arranged to show a uniform red color, but rather, the calyx should show in with the red. For the best effect, and for particular markets where the grower has steady customers, the berries should be graded into two sizes. This is to give uniformity to the fruit, and will make the package more attractive.

It is a well known fact that the attractiveness of a package of fruit sells it. The customers are attracted through the eye, and everything that aids in making the package attractive will increase the value of the fruit and ease in selling.

It does not pay to pack inferior fruit with good fruits, for it invariably works against the reputation of the grower. Too little attention to uniformity in pack and grading will often result in a loss to the grower.

❖ ❖ ❖

It is time that our fruit growers and farmers learned to standardize their products in the same manner as the manufacturer of staple food articles. A reputation for perfect product, together with honesty in measure and packing is the greatest asset that the fruit grower has.

The low prices obtained for small fruits are in many instances due to the carelessness of the grower. The prevalent idea among fruit growers is that when the prices are low it does not pay to take the care and pains that should be taken, as the returns do not warrant it. This is wrong reasoning, for one might argue with equal reason that when the fruit is high, the consumer will take a poor pack and a poor grade, as the demand is greater than the supply.

The grading and packing of fruit should not be regulated by prices obtained. If any change in the ordinary rules of packing and grading is to be made during a period of low prices, it should be made towards greater care, so that the fruit will sell, regardless of any over-supply.

A good example how appearance sells fruit is found in the Ben Davis apple. Almost every consumer knows the quality of this particular apple, yet when properly graded and packed in a new box, the looks of the apple will sell it, regardless of its qualities.

HINTS FOR SEPTEMBER

CUT off the ends of the vines of the tomato plants. All fruits that will ripen or even grow to a good size before frost will be set now and by stopping vine growth all the food goes to the fruit making it grow larger and ripen more quickly.

As the heads of the cauliflower develop the leaves should be gathered together and tied with a string or folded over. This will insure the beautiful white heads that we desire.

Roll down the onion tops with a barrel. This hastens maturing. Onions should be lifted before any severe freezing as frost impairs the keeping quality.

Use Pyrethrum Powder on cabbage for the green worm at the rate of 1 oz. to 1 gallon of water.

By using a cold frame it is possible to grow lettuce, spinach and radish until late in the fall. As these plants are hardy they need covering only during severe frost.

The splitting of cabbage is caused by too rapid growth, and may be prevented by breaking the roots of the plant on one side when the head is hardening. Cabbages that are not fully grown at lifting time may be dug with the roots and if kept in a cool cellar will continue to grow for some time.

Clean away everything on the ground after harvesting a crop and put it on the pile to rot. Many diseases are carried over from year to year through the leaving of these on the ground to be plowed in.

Get the squash and pumpkin gathered before heavy frost comes. They do not keep well if frozen. Cucumber, if gathered green and kept in a cool fairly dry place, will last well into the fall. Tomatoes also may be picked green and will ripen gradually if kept cool and light. To hasten ripening place in a warm dark room. Their quality, however, is not as good.

A .H. MACLENNAN

CUCUMBER WILT

THE wilt of cucumber, muskmelon, squash and pumpkin is a disease of bacterial origin. The organism which causes the disease produces a slimy matter, which fills up the water ducts and prevents the passage of water to the leaves. The consequence is that the affected parts wilt away. In various localities the disease attacks different plants with special vigor, and this year in the district round Montreal cucumber plants are more specially affected, whilst the squash is only slightly attacked and pumpkin and muskmelon are practically immune.

The striped cucumber beetle spreads the disease from vine to vine, inoculating the flowers with the bacteria, from which point the organisms work back to the main stem. Once the main stem is infected the whole plant is lost.

In wet summers with much water circulating in the vines a plant is lost the moment it becomes inoculated, but in a dry season as we are having this year it takes considerable time before the germs work back through the runners to the main stem and it is possible to save affected plants. The following measures should be taken as soon as the disease appears: — Cut off all infected runners at the base, being careful to dip the knife in a strong disinfectant after each cutting. The diseased vines should be gathered together and burned carefully. In case a viscid liquid appears on the cut surface, the disease has apparently penetrated into the main stem and it is advisable to pull up the whole plant and burn it. Spraying the healthy plants with Bordeaux mixture has often had a beneficial influence. Of course the easiest method of control would be to destroy the striped cucumber beetle and the squash bug, but it is a practical impossibility to check these pests effectively.

In staked cucumbers the disease is much more prevalent and very destructive; this is due to the fact that all infection is directly in the main stem, and further that the cutting out of the runners usually with one and the same knife gives many opportunities for infection.

J. VANDERLECK

PACKING APPLES REALLY AN ART

THE Duchess and similar early varieties of apples must be picked before they are mellow, if they are to be shipped. Pick the apples carefully by hand into a clean basket, preferably one lined with burlap, and take to a cool shed or cellar to be packed. The standard apple barrel is the best package for most of the Minnesota fruit.

"There are three steps in the packing of a barrel," says W. G. Brierley of the Minnesota College of Agriculture. "The first is the facing; second, the filling; and third, the tailing. After the bottom is taken out and the pails flattened, well-graded apples, which are representative of the barrel, are arranged in rings, stems down, on the face head of the inverted barrel. They should fit closely. After this layer is in place, a second can be put in or not, as desired. Fill the rest of the barrel with well-graded fruit. After each half-bushel is added, shake the barrel gently but firmly to settle the fruit and to fill all spaces. When the fruit is within about two inches of the top, even off and then finish the pack, called tailing, by building up the end two or more inches above the chimes. Put the cover on, with or without a cushion, and then use a press to force the cover into place. Do not neglect to do this thoroughly because apples shrink, and unless tightly packed they will bruise, badly. Some of the fruit will be bruised but not so much as if packed loosely. Nail the head securely, and mark on it the name of the variety, the grade and your own name. Market as soon as possible."

FOREST FIRES

Careless Settlers Responsible For Great Forest Losses, by Robson Black, Secretary, Canadian Forestry Association

THAT sooner or later all settlers in wooded districts will be placed under a rigid system of permits for 'slash burning' has long been taken for granted by forest engineers. Quebec Province has already made excellent advances in this direction. When the day arrives that no settler in any part will think of starting a blaze in his clearing without a permit from a inspector or ranger, the people will be the richer by millions of dollars worth of unburned timber, not to mention the increased safety to human life.

It is recognized by everyone that new farms in timbered country, granting that the soil is best adapted to agriculture, must be cleared and no very expensive way of doing the clearing can be imposed on the settler. The object of the existing Quebec law is to have the settler consult a ranger who will define the best season to do the burning with least risk to surrounding timber, and will show the farmer how to pile his brush and lessen the danger from flying sparks. This may demand a slight delay and perhaps a little more work on the farmer's part, but no one should forget that the losses caused by careless settlers in Quebec would have bought out every acre of their farms ten times over. For the good of the greatest number, each citizen must sometimes take what seems a roundabout way.

The most aggravated and unreasonable form of fire damage in Quebec is to be attributed to what is known as the 'fake settler'. This brand of citizen has caused some of the worst forest fires in the province during times past and even within the last two months numbers of bad incipient blazes have been traced to this source. Such is the well-proved claim made by inspectors working for the St. Maurice Valley Forest Protective Association and officers of public societies interested in forest protection.

Reports just received by the Canadian Forestry Association of Ottawa show that while good laws are on the statute books of Quebec to ward off the 'fake settler' his presence is still evident. Some of the guilty parties, when brought face to face with their destructive work, confessed to inspectors that the 'homesteads' which they occupied were taken not for cultivation purposes but solely for the valuable timber thereon. One party said that with the assistance of a small boy and horse he had cleared over $1100 during the winter of 1913-14 and over $500 during the following winter. Upon asking him what his intentions were, once the timber was cleared from the land, he said he would have to clear out, as the soil gave no man a chance to earn a living by farming.

"Fake settlers" do three kinds of damage. They turn what might be a good farmer into a roving timber speculator, spoil the area in which they work for future reproduction of trees and, what is most important, constitute a continual menace to the safety of all neighboring timber by the ignorant and careless use of fire. Their method of operating is to secure from the government a homestead patent, first taking care that the 'homestead' is located in the middle of some first-class pine. That done, he proceeds to do his cutting. Knowing that his timber cost him nothing whereas all limit holders pay large sums, he strips the area as bare as possible in the briefest time and markets his product. In a year or two, the timber being exhausted, he pulls up stakes and moves along to the next free 'homestead'. Of all residents of the township, he practises least care. He welcomes fire which usually simplifies his logging operations and has little concern if a blaze started on his premises kills off a million dollars worth of the province's forest growth.

British Columbia enforces a law by which no settler shall start a fire on his place between Spring and Fall without a 'permit'. Rangers see that his slash is properly piled and isolated from the edge of standing timber; also that it is not set afire during intensely dry spells or high winds. Quebec also possesses a good law covering this point of settlers' fires, but enforcement in some districts needs a greatly increased force of officers. That any increased expenditure for such purpose would be well offset by the timber annually saved from destruction has been demonstrated by forest experts again and again.

THE KILLING OF PLANT TISSUE BY LOW TEMPERATURE

Chandler, H. W., in University of Missouri, College of Agriculture, Agricultural Experiment Station, Research Bulletin

IN these experiments the plants were subjected to low temperatures in a chamber surrounded by ice and salt. The density of the sap was measured in terms of the depression of the freezing-point as determined by a Beckmann Freezing-Point Apparatus.

Of the several forms of injury from cold, such as mechanical injury due to tension developed at low temperature, or evaporation from the surface when the conducting tissue is frozen so as to prevent the movement of water to that tissue, and the killing as a result of long, continued exposure to low temperature, it is the last form of injury or *freezing to death* which is dealt with in this paper. It is characterized by the tissue taking on a brown, water-soaked appearance after thawing.

During the freezing of the tissues, ice generally forms in the intercellular spaces, causing a withdrawal of water from the protoplasm. The amount of water loss necessary to result in death varies with the different plants and different tissues.

In the case of plants not in a resting stage the resistance of the tissues to cold is in direct relation to the density of the sap, and conditions which tend to increase the sap density increase the hardiness of the tissues, and vice versa. Increasing the density of the sap by withholding water from plants was found to be more effective than applying salt solutions. This latter method was only found to be effective in sand cultures. Since salts are as effective as organic compounds in solution, it follows that the injury to the protoplasm is due rather to the mechanical withdrawal of water than to the precipitation of the proteins by freezing. It is well known that the cortex, winter buds and sapwood of deciduous trees increase in hardiness during the four to six weeks before leaf-fall. This was found to be associated with a change in the composition of the proteins tending to keep them in solution at lower temperature thus furnishing additional proof that "freezing to death" is not due to the precipitation of proteins.

The rate of thawing appears to have no effect on the resistance of the fruit buds and young fruit of peaches, though rapid thawing causes serious injury to ripe apples and pears. It has also no effect on the resistance of leaves and stems of growing plants, except lettuce. Most fruit buds are damaged by rapid freezing, a rapid fall of temperature before zero is reached being much more injurious than below zero. This probably accounts for the phenomenon of "sun scald" in apple trees, and emphasizes the necessity of maintaining the temperature of orchards when once the temperature has risen.

The most important feature affecting the hardiness of plant tissue is maturity, that is, the condition of resistance reached during the winter dormant period. Thus, late growing trees are less resistant to early frosts, and rapidly growing cover crops are useful in orchards in checking the growth and promoting the maturity of the bark and buds, thereby increasing their resistance to cold. The bark of various parts of the tree varies considerably in its resistance. In summer the lower portion of the trunk is more resistant than the upper, whereas in winter the converse is true. Trees may be protected from damage during severe winters by heaping manure and straw round the base of the trunk. This increased resistance of the branches over that of the trunks is due not to an increased moisture content of the latter, but to the greater sap density and to changes in the protoplasm which enable it to withstand the great loss of water. The most tender tissues above ground after complete maturity are the pith cells and the fruit buds. Generally young leaves and shoots are more sensitive to cold than full grown leaves, except in the case of lettuce. Succulent plants like cabbage, kale and lettuce are capable of acquiring hardiness by experience, but this is not the case with tomatoes, peas and tender plants generally.

The cambium is least resistant during active growth, but during the winter it is more resistant than the cortex and often survives it. The most tender tissue of the tree at all seasons is in the roots and the degree of tenderness increases with the depth. Different trees show considerable variation in the resistance of their roots.

The maintenance of the resting period is of considerable importance in the resistance of the tree to late frosts. Trees with a vigorous growth late in the year maintain their resting period longer than less vigorous trees. This vigorous growth can be obtained by a judicious application of nitrogenous manures and pruning. Whitewashing the buds, by reflecting the heat, causes them to remain dormant for a longer period.

The pollen of the apple will resist lower temperatures than any other tissue of the flower when in full bloom. Normal pollen has germinated after being subjected to a temperature of + 18° F. and, after drying, + 10° F. Unopened flower buds are more hardy than those fully opened. Thus, flowers on the outer half of the twigs which open first are less likely to survive a spring frost. The trees should therefore be pruned to a sufficiently open head so that the leaves at the base of the twigs will not be shaded off before the fruit buds are formed.

Owing to the great differences in hardiness between the individuals of the same variety, the writer believes that the most effective way of overcoming the dangers of injury from frost is by plant breeding and selection of the more resistant strains.

Judge: "Where have I seen your face before?" Prisoner: "I am the dentist who pulled your tooth last week." Judge: "Fifteen years!"—*Credit Lost.*

THE FARM AND FARM CROPS

Part of thirty-acre oat field at Macdonald College.

MAKING SILAGE

AT the time of writing prospects are good for full silos. A number of silos are already being constructed and the present promise for corn should help to increase the number of new sites for this year's crop. To those at least who are filling silos for the first time a discussion on the subject of making silage should be of interest.

It should be understood, however, that this season sees only one important stage in the process of furnishing our greatest of all feeds to stock. To make this year's silage crop do what it is capable of doing for us from this out we must have a large quantity of corn with sufficient maturity to furnish feed of quality in abundance and insure its preservation under proper conditions. In other words, there are two important considerations in measuring our crop, yield and quality. Corn occupies its present position in our farm practice because of its ability to furnish such a *large yield* of a *good quality* feed. Failing in either of these points therefore, it does not realize its possibilities and may fall far short of occupying its proper place.

Which of these two considerations should be first in value may be an open question. Personally I do not share the opinion of those who think we can afford to largely ignore either one. In my opinion a balance should be kept between the two. Quality and yield will work together in most of Quebec but the same combination will not do in all sections. There are those who insist upon more maturity and its corresponding small yield than is necessary for proper preservation and feed of good value, and there are those who in their ambition for yield grow corn that yields a big tonnage of material too inmature to result in good silage. Generally, such silage can be fed with no apparent injury if not held too long, but the excessive acidity formed is detrimental and the feed lacks the nutrition it otherwise might have.

Given then that we have a field that will yield twelve to fifteeen tons to the acre, the question before us now is, first, one of maturity. This year corn should mature sufficiently for first class silage if conditions are right. Time of planting, season and soil are always factors of importance, but perhaps first should be mentioned variety, and secondly thickness of planting, because these are telling factors and may be absolutely controlled. If we have the right variety—and in this, considerable choice is possible—planted about forty inches apart with four or five stocks to the hill, or forty inches apart with a stock every seven or eight inches if planted in drills, we can count on the best chances for maturity.

Corn properly matured for silage will be fully developed and the kernel entering the dough stage, and some of the leaves at the bottom as a rule show some drying out, although this may not always occur in moist conditions.

If cut much before this, too much acid will develop and a loss result. If cut after this it is difficult to pack in the silo, less can be put in, it becomes too dry and is apt to mould and considerable of the hard corn will not be digested by cattle.

Frost is often something to be reckoned with. A severe freezing is injurious to corn for silage. On the other hand a little frost may improve inmature corn because it has a drying effect which tends to reduce fermentation. It would often seem well, therefore, to run a little risk rather than cut corn in an extremely green condition as is too often the practice.

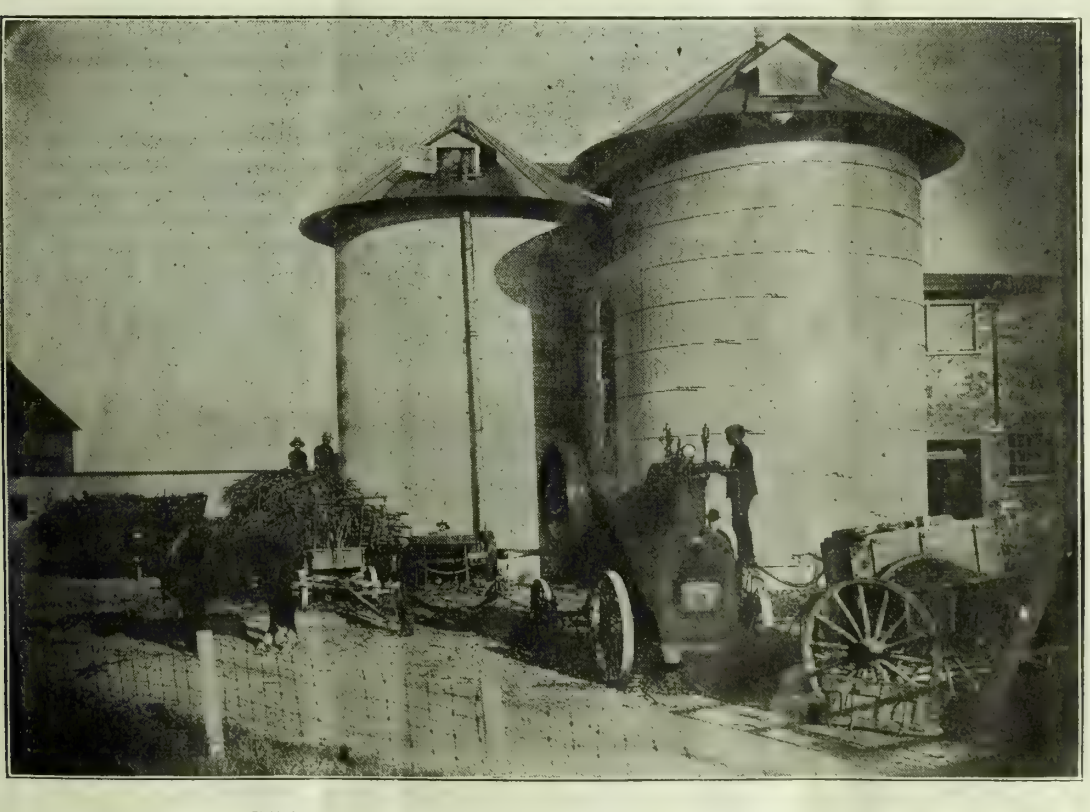
Whether the corn should be taken to the silo at once after cutting depends on a number of things. Sometimes it is necessary to cut ahead to manage things to best advantage. If corn is on the soft side it will be improved by cutting ahead, but if it has to lie for any length of time in wet weather it may become dirty and deteriorate considerably. Again if it has passed the proper stage for cutting some rain will have a beneficial effect on its keeping.

There are two common methods of filling: the cutter with carriers for elevating, and the blower. The first requires the least power and is easier to regulate in speed of filling but is more difficult to set up for large silos and the silage is not so well distributed.

In the actual filling there are two important considerations; the silage must be well packed, and the corn, leaf, and stem must be evenly distributed. Silage distributers are now on the market and by means of them the silage may be conveyed directly to any spot in the silo so that the leaves and stems do not separate from the cob. This is a good labor-saving device especially in silos of 15 ft. or over in diameter. If one of them is not used care should be taken to distribute the silage well and tramp it thoroughly, especially around the sides and at the doors. The faster it is filled the more tramping it will require. By allowing it to settle and refilling, considerably more corn may be stored.

After the silo has been filled, in some cases feeding starts at once. The top silage will be hot for a time and not in the best condition for feeding, although with this plan no waste will occur if a layer of a few inches can be taken off daily and fed at once. Usually the silo is left for a time before feeding begins, and if any corn has been left over it can be fed to best advantage in the early fall and the silage saved for later feeding. In such event the silage may be covered with something cheaper than silage if such can be found, such material as chaff, old hay, or cut straw. It should be well wet and well tramped from time to time until the silage settles. A few oats scattered through it will germinate quickly and help to seal the top covering. The most immature corn should be put on the top of the silo. If it is all well eared, the ears might be broken off the last load or two and more profitably fed to pigs, because there is likely to be some loss on top.

When the silo is opened and feeding begins, care should be taken to keep the surface of the silage hard and smooth. A rake is a good implement to keep the loose silage raked off with each feeding. No holes large or small should be dug in the surface. In winter when frost troubles, a crowbar or



Filling two types of silos at Macdonald College.

pick will prove useful in the silo because, should it freeze just a little around the edge, the sides should be kept lower than the centre, and a fork is a poor tool with which to accomplish this result.

H. BARTON,

Macdonald College

ROOTS

Good Results of Seed growing in our Province

AT the beginning of the present terrible European struggle the farmers of Canada were strongly advised to make an effort at producing their own root and vegetable seed. Many growers responded to the call, not only in this province but in other parts of the Dominion as well.

During the last weeks we have visited several seed growers in the province of Quebec and we are glad to be able to report that the prospects for the production of first class seed are in the majority of cases most satisfactory. Wherever the roots had been given a fair chance, i.e. where they were planted in moderately rich soil which was kept clean and well mulched. the seed roots had developed strong flower stalks with abundance of seed. This season, on the whole, has been favourable for seed growing. The early spring allowed early planting, which gave the roots and other mother plants a good start, and moisture conditions have been quite satisfactory in most districts. On some farms the swedes suffered from attacks of the green aphis, but where these intruders were in time treated with tobacco extract the attack was checked. In other places black aphis appeared on the seed mangels, but to our knowledge they did not do any serious damage. This insect is even more easily controlled than is the green aphis by spraying twice with a solution containing 0.1 per cent nicotine.

Fig. 1. A 150 foot sow of mangels, swedes and onions for seed grown by Clarence H. L. Hawley, Clarenceville.

Most growers are aware of the danger of planting two or more different varieties of the same kind of roots and vegetables too close to each other, but there are still a few beginners who apparently ignore the crossing danger. It should be remembered that all roots and vegetables cross-fertilize within their kind, and that a mixture of types will be effected through the agency of wind or insects unless mother plants belonging to different varieties are sufficiently separated. In general it is scarcely advisable for one man to grow, for instance, more than one kind of onion seed, or to attempt to produce seed from several varieties of cabbage, etc., unless he has well prepared land on different parts of his farm. To grow them in the same garden invariably results in crossing, as the bees and other insects travel from one flower to another in their search for pollen and honey.

Fig. 2. Mr. Louis Rocheleau, Philipsburg, among his seed mangels.

It is too early yet to say anything definitely about the yield. This will of course vary considerably according to kind, variety, soil and moisture conditions; but we saw only one root seed plot where the yield could be said to be really poor, and there it was the fault of the grower himself, who had neglected to keep the land free from weeds. These marauders naturally got the better of the poor mother roots and deprived them of food, water, air and sunshine. The man who does not rid his land of weeds either previous to planting, which is really the best policy, or after, not only decreases the immediate yield of seed but also increases his future chances for abundant production of weeds.

It would carry us too far to mention all the different growers whom we had the pleasure of visiting, but a few words may be said in explanation of the illustrations. Of these numbers 1, 2 and 3 speak for themselves, excepting in so far as they do not adequately demonstrate either the glowing enthusiasm of Mr. Hawley, the skill and ability of Mr. Rocheleau, or the thorough understanding of Mr. Parker. Suffice it to say that all three will harvest some excellent seed of onions, mangels and swedes. The two first named gentlemen are trying seed growing for the first time this year, but Mr. Parker produced a few pounds of mangel seed of Macdonald College stock in the year 1914. This "Yellow Intermediate" seed was planted in the spring of 1915, and as the supply was not sufficient for the planting of the whole field some seed of the same variety was bought from a local dealer. The rate of seeding was equal in both cases—15 pounds per acre,—but the stand resulting from the two kinds of seed was entirely different. The difference was so noticeable that we took a picture of the two adjoining plots. In Figure 4 it may be noted that the home grown seed has given a satisfactory stand of healthy, vigorous plants, whereas the commercial seed not only shows a number of misses in the stand, but the individual plants are not nearly so uniform or well shaped as the plant from home grown seed.

This is only one of the many instances where home grown seed has shown its superiority over market seed. It would, however, be entirely wrong to put all the blame for poor seed on the Canadian seedsman who in most cases tries hard to supply his customers with the best obtainable foreign seed. The fault lies fully as much with the Canadian farmer who does not produce home grown seed in sufficient quantities to be distributed through the seedsman or through their own organisations.

Fig. 3. Field of swedes and mangels for seed, owned by Mr. J. H. M. Parker, Lennoxville.

The experience gained this year by some of the more enterprising farmers should give ample material for interesting discussions. We would like to suggest that agricultural societies and farmers' clubs take up this important question on the programmes for their meetings during the coming winter.

P. A. BOVING,

In charge of Root Crop Investigation, Macdonald College

AFTER HARVEST CULTIVATION

By John Fixter, Supervisor of Illustration Station

THAT THE LOSSES due to weeds are enormous is generally admitted. Weeds rob the soil of the plant food intended for crops and also rob the soil of its moisture. Weeds crowd out and take the place of more useful plants, being hardier, and, as a rule, more prolific. Many noxious weeds increase rapidly, due to the fact that farmers and others have not been aware of their nature and power to spread.

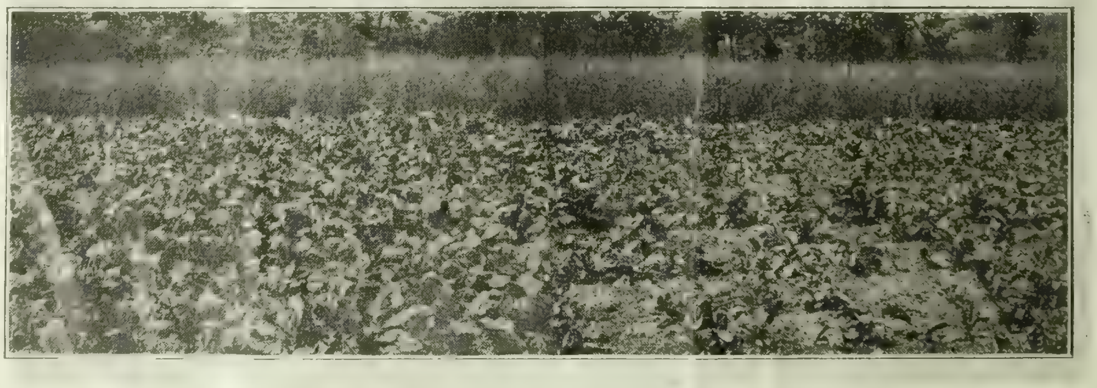


Fig. 4. "Yellow Intermediate" mangels at Mr. J H. M. Parker's farm, Lennoxville.
Homegrown seed. Commercial seed.

One of the best plans found to eradicate weeds is as follows: Immediately after the hay or grain harvest plough the land very shallow with a gang plough, turning a furrow two or three inches deep; then put on a good heavy land roller, packing the sod to hasten decay; next use the disc and follow with the smoothing harrows. Should any weed growth appear, keep the disc and smoothing harrows going at short intervals until the sod is well decayed; then a cultivator with good broad points may be used. The object is to destroy all weed growth until autumn, when the soil should be thoroughly ploughed and well set up to the winter frost.

On such land it is best the following season to put in some kind of hoed crop, such as roots, corn, or potatoes, that requires constant hoeing and cultivating during the growing season. If this method of cultivation is closely followed, it will be found to be one of the best plans of eradicating noxious weeds, and also of preparing the soil for future crops.

Following are results obtained on one of the illustration stations: Two plots of oats of four acres each, were used for experiment. One plot was ploughed shallow immediately after harvest, and was cultivated occasionally, all growth thus being kept down, and was then ploughed late in the fall at the same time as was the adjoining plot which had been left unworked. The grain from the two plots was weighed. It was found that the after-harvest cultivated plot gave a difference of 15 bushels per acre or 60 bushels in all. This at 50 cents a bushel shows a gain of $30.00. Counting the cost of cultivating at $4.00 an acre, it would mean a total cost of $16.00 for the plot, and that amount deducted from the $30.00, shows a gain of $14.00.

The difference in the profit from the two plots next year, working them alike, should be almost as much, as the soil on the plot cultivated is in a much finer condition and almost free from weeds.

HOW TO MAKE WHITEWASH

WHITEWASH is usually made by slaking lime with water, adding more water and applying with a brush or broom. At least this is the way we did it down on the farm.

A whitewash that will last longer than one season on the inside of buildings and which I believe has been recommended in one of the government reports is made as follows: Slake half a bushel of lime with boiling water, keeping it covered; strain and add a peck of salt that has been dissolved in warm water, three pounds of ground rice, boiled to a thin paste, half a pound of powdered Spanish whiting and one pound of clear glue dissolved in warm water. Mix and let the compound stand for several days. Apply as hot as possible, using a brush kept especially for the purpose.

This whitewash will cost more than the other but makes a very white smooth surface and is quite enduring. Where whitewash is applied to rough boards, fence posts, etc., for disinfectant purposes a more suitable mixture is made by adding water and some disinfectant to slaked lime. The above formula is intended more for inside finishing where in some places it will be quite as satisfactory as the more expensive paint.—*Geo. H. Glover.*

WHY SILAGE MOLDS

WHENEVER the subject of silos and silage comes up, this question is usually asked, "Why did my silage mold?" The writer has listened to the discussion and feels that too many times the answer has not been quite satisfactory or clear, and farmers go away but little informed. The filling of a silo bears a close resemblance to filling a kraut barrel for the winter's supply of sauer kraut. Silage is a feed that has been preserved in a succulent stage, so is sauer kraut. Nearly every farmer has helped make kraut, and he knows the art of it. If he ties his knowledge up with a silo and its filling he will, no doubt, be helped in seeing why his silage molds. Let us consider molds as plants. They require air like all other plants and animals. The absence of air means their death of inactivity. Molds, or their spores, are on the cabbage that goes into the keg and they are on the corn that goes into the silo. Their introduction cannot be prevented in either the keg or silo; but their growth, and consequently spoiling of kraut and silage, can be prevented.

Every farmer knows that he must tramp the kraut until all the air is driven out and its place taken by a brine which is given out of the succulent cabbage. When the brine reaches the top, it is safe to say the kraut will keep.

Now, if for some reason there is a leak in the keg, below or on the side, and the brine escapes, air will sink down in the kraut and spoil it. If the side of the keg absorbs the brine and more brine does not take its place, the kraut will spoil near the side. If the brine evaporates off the top, to or below the surface of the kraut, the kraut will spoil in that region. In other words, where there is air the kraut spoils.

Now go to the silage question. If the silage is not absolutely packed and thoroughly distributed, the air will remain in spots and be locked under. That spot will mold. If the sides are not thoroughly tramped, air will creep down and spoil that silage.

We do not exactly expect to get a brine on top of silage, but we should strive for the same thing when we hope to get all the air out. If we did expect to get a brine and strove for that, then there would be less moldy silage. Do justice to the tramping and distributing and also add water as a safeguard and a check on the tramping. It is true, most everyone adds water, but do they add enough? Isn't it possible that perhaps the silage absorbed all that was added and thirsted for more? I wonder if it wouldn't be well to add some water each day for several days after filling, until you were convinced that the silage was absolutely saturated from top to bottom. If the silage is saturated and some water left over, air can not stay in silage; for the heavier water will drive it out and take its place.

All farmers may expect more or less molding near the wall, which invariably absorbs some of the moisture near it.

All corn will carry molds to the silo and there is more chance for mold in the ripest corn—not because it was ripe but because it requires more careful filling and a greater addition of water; and too often such corn gets the same treatment as the greenest corn.

There is little or no use of a long debate on moldy silage. The answer to the question, "Why does silage mold?" is this: Either the air was not driven out by the process that should be used to get it out; or, if it were driven out, it got back in; and where air stays, molds grow and nowhere else. Take the same precautions in filling a silo as in filling the kraut barrel.—Hoard's Dairyman.

AIR IN WATER PIPE

Editor Journal of Agriculture:—

I wrote you sometime in regard to rust in water pipe running for spring to house, but since found that it is not rust stopping the water, but it is air causing it to stop. Will give full particulars.

The spring is 200 feet away, connected by ½ in. pipe; plenty of water in spring all the time over the pipe, but the air gets in some way and the water will nearly stop. If I take the stock pipe out at the house the air will gurgle out for a few minutes, and if I put the stock back, it will run full stream again for a day or two and it will stop the same way as before until I let the air out again.

Where do you suppose the air gets in when the water is over the pipe in the spring at all times and do you know any way to remedy the matter?

J. L. B.

Answer.—In reply to your letter regarding the air in your water pipe, we are quite sure that the trouble is caused as follows: The pipe which you ran from your house to your spring is not on an even grade all the way from the spring to the house, that is, there are high spots in the pipe. The correct way to lay it would be to have it slope down all the way from the spring to the house so that every point on the pipe is at least a little lower than any point above it.

Now to explain how the air gets in the pipe you must understand at the beginning that all water which is exposed to the air has air absorbed in it. This air is absorbed at the pressure of the atmosphere. Now as this water runs down the pipe, and if the pipe has high spots in it, there are points below the high spots on the side towards the house where the pressure on the water is less than one atmosphere.

At these points some of the air leaves the water and forms bubbles. These bubbles gradually collect at the high spots in the pipe. They act as an air lock and retard the flow of the water, or sometimes stop it entirely. That is the air which appears in your pipe is air which is absorbed in the water and which leaves the water after it is in the pipe.

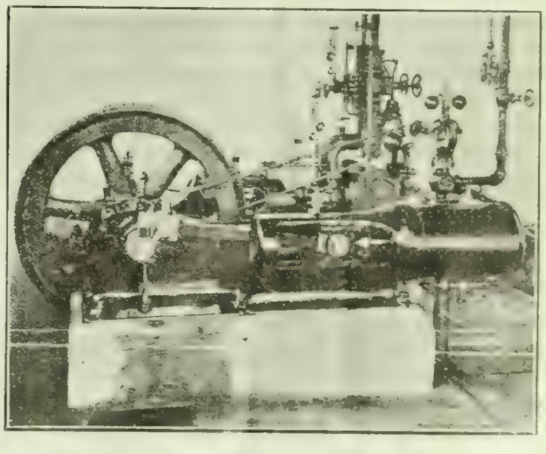
Now to remedy this the only thing you can do is to take up the pipe and lay it so that it slopes down hill all the way from the spring to the house. When you have it laid in this way any air that may come out of the water gradually works its way up and comes out at the spring, but it does not interrupt the flow. When you can afford it I advise you to put in a pipe at least 1" in diameter, 1¼" would be better still. Lay this also as I have described.

C. J LYNDE

CONCRETE FOUNDATIONS FOR FARM ENGINES

TO obtain the highest efficiency an engine should have a heavy and firm foundation. This will not only reduce wear and tear incident to excessive vibration, but will result in prolonged and better service. Rigidity and durability in the foundation are best obtained through the use of concrete.

The concrete should be mixed in the proportion of 1 part Portland cement, 3 parts clean, well-graded sand, and 5 parts crushed stone or gravel. All parts should be determined by volume and the use of accurate measuring boxes should be rigidly observed. The sand should all pass a ¼-inch mesh sieve, and the crushed stone or gravel should pass readily through a 1½-inch sieve. In no case should bank-run gravel be used as taken from the deposit.



A Durable And Rigid Concrete Engine Foundation.

It should be passed over ¼-inch and 1½-inch screens. That which passes the ¼-inch screen is sand, and that which passes the 1½-inch screen and is retained on the ¼-inch screen is gravel. If the size of the engine warrants the use of a reinforced concrete footing, a 1:2:4 mix should be used for the reinforced portion of the concrete. Sufficient water should be used to form a plastic, wet consistence, but not enough to cause separation of the cement and aggregates when placed.

FOOTINGS

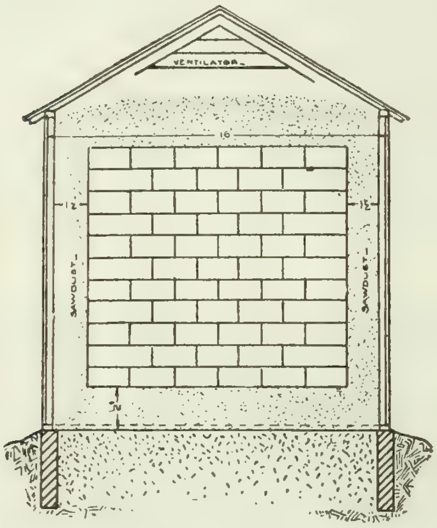
For footings over 6 or 8 square feet in plan, stone up to 2¼ inches may be used. The stone should be graded, as this will insure a strong, dense concrete.

CONSTRUCTION

After the exact location of the center line of the foundation has been carefully established, a pit 2 feet to 4 feet deep should be excavated, the length and width being the exact size of the footing. Deposit the mushy wet concrete to the depth determined on the plan. In order to thoroughly key the engine foundation to the footing, embed 3- or 4-inch stones in the portion of the footing under the engine so that they will protrude from the footing.

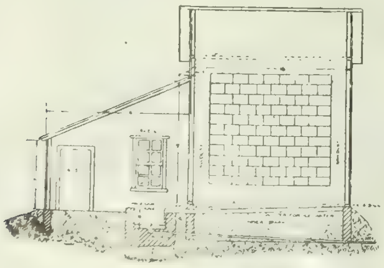
THE FORMS

A box form 8 inches larger in length and width than the engine base should be carefully set over the footing. The inside of the forms should be thoroughly oiled to prevent the concrete from adhering. It is essential that the anchor bolts for the engine be carefully spaced and so placed as to take care of any small variations in position. Use a templet for this purpose, and supply for each bolt greased gas-pipes of twice the diameter of the bolts, the pipes to be removed before the engine is set. The purpose of the pipes is to provide for such slight adjustment of bolts as may be required. The anchor bolts should be embedded in the concrete at least 18 inches, and supplied with cast-iron washers at the lower ends.



Front view, in section, of ice house. The dairy is built in the form of a lean-to at rear.

After the templet has been accurately set over the forms and the bolts so arranged that the tops are at proper elevation, the concrete is carefully deposited and spaded in the forms. Turn the gas-pipes from time to time, thus preventing them from sticking to the concrete. The concrete along the forms should be carefully spaded to prevent the formation of air-bubbles or pockets.



Sectional view of combined ice house and dairy. For ice house only the lean-to section and lower drain may be omitted.

Damp burlap should be placed over the form after the concrete is placed. This will insure normal setting of the material. After twenty-four hours remove the form. The engine may be set and the bolts adjusted after forty-eight hours. Before the engine is set remove the gas-pipes referred to above, and when the engine is finally placed, fill the space around the bolts with 1:1 mortar.

Do not use the engine until the base is at least two weeks old. If necessary to have an exhaust or drain pipe, this may be installed in the form before the concrete is deposited.

KILLING FLIES WITH HELLEBORE

A safe and effective weapon against the typhoid or house fly has been found in powdered hellebore. Flies lay their eggs chiefly in stable manure. Powdered hellebore mixed with water and sprinkled over the manure will destroy the larvae which are hatched from the eggs. Since powdered hellebore is readily obtainable, this puts in the hands of everyone a remedy for one of the pests that has been found dangerous as well as troublesome. Powdered hellebore, however, will not kill adult flies, which must be swatted or trapped.

It has long been known that flies breed in manure, but previous methods of destroying the larvae there by the use of strong chemicals have been open to the objection that the treatment under some conditions lessened the fertilizing value of the manure or actually injured vegetation. This is not true of powdered hellebore. Government experiments have shown that the hellebore is entirely decomposed in the course of the fermentation of the manure, and that even in excessive quantities it does no harm except to the larvae it is intended to destroy. Chickens picking in manure treated with it suffer no ill effects.

One-half pound of powdered hellebore mixed with 10 gallons of water is sufficient to kill the larvae in 8 bushels, or ten cubic feet of manure. The mixture should be sprinkled carefully over the pile, especial attention being paid to the outer edges. In most places hellebore is obtainable in 100-pound lots at a cost of 11 cents a pound. This makes the cost of the treatment a little less than seven-tenths of a cent per bushel of manure. A liberal estimate of the output of manure is 2 bushels a day per horse. The money involved is therefore trifling in comparison with the benefits to the individual and the community from the practical elimination of the disease-spreading fly.

Although fresh manure is the favorite breeding spot, flies lay their eggs in other places as well, such as outhouses, refuse piles, etc. In these places, from which no manure is taken to spread on the fields, considerable saving may be effected through the substitution of borax for powdered hellebore. Applied at the rate of 0.62 pounds per 8 bushels of manure, borax is as effective as powdered hellebore in killing the larvae but costs less than half a cent for each bushel of manure treated. In larger quantities, however, or when the manure itself is spread at a greater rate than 15 tons to the acre, some damage to crops may result. Large quantities of manure are often used by market gardeners and others, and there is always danger of carelessness in applying the borax. The use of the more expensive but safer hellebore is therefore recommended for the treatment of manure. Borax is recommended for all other refuse in which flies may lay eggs.

Scientists who have been working for years to eliminate the fly are convinced that the use of one or the other of these simple measures is a public duty wherever manure and refuse exist. Sanitarians, however, strongly advise the removal of refuse heaps or other unnecessary rubbish or breeding places for flies. In breeding places which can not be thus disposed of, such as manure or stables, the daily use of powdered hellebore will keep the flies from breeding in these favorite breeding grounds. The best results are obtainable in a community where everyone cleans up his premises, traps or kills the flies, and systematically treats the manure and other breeding places with powdered hellebore.

The fly is not only a nuisance to human beings and live stock, it spreads disease and filth and is a menace to public health which can not be tolerated in the face of a demonstrated remedy.

QUEBEC FAIRS, 1915

List of Fairs to be held under the auspices of the Agricultural Societies

County	*Towns*	*Dates*	*Secretary*	*Address.*
ARGENTEUIL,	Lachute,	Sept. 8-9-10,	G. J. Walker,	Lachute.
ARTHABASKA,	Victoriaville,	Sept. 21,	C. R. Garneau,	Arthabaska.
BAGOT,	St. Liboire,		L. A. Brunelle,	St. Liboire,
BEAUCE, DIV. A,	Beauceville,	Sept. 30,	Jos. Bernard,	Beauceville,
BEAUCE, DIV. B,	Lambton,	Sept. 14,	Pierre Fortier,	Lambton.
BEAUHARNOIS,	St. Louis de Gonzague,	Sept. 22,	W. Martin,	St. Louis de Gonzague.
BERTHIER,	Berthierville,	Sept. 23,	G. Allard,	Berthierville.
BONAVENTURE, DIV. A,	New Carlisle,		Geo. M. Kempffer,	New Carlisle.
BROME,	Brome,	From Aug. 31 to Sept.2,	G. F. Hall,	Brome.
CHAMBLY,	St. Bruno,	Sept. 22,	Ad. Benoit,	St. Bruno.
CHAMPLAIN,			D. T. Trudel,	St. Genevieve.
CHATEAUGUAY,	St. Martine.	Sept. 7,	N. Mallette,	St. Martine.
COMPTON, No. 2,			N. G. Scott,	Scotstown.
DRUMMOND,	L'Avenir,	Sept. 21,	J. C. St-Amant,	L'Avenir.
GASPE, DIV. A,	Cape Cove,	Oct. 26,	J. J. H. Balleine,	Cape Cove.
HOCHELAGA,			J. A. O'Gleman,	90 St. James, Montreal.
HUNTINGDON, DIV. A,	Huntingdon,	Sept. 9-10,	W. F. Stephen,	Huntingdon.
HUNTINGDON, DIV. B,			R. Ellerton,	Hemmingford.
IBERVILLE,	St. Alexander,	Sept. 7-8,	E. S. Lalanne,	Mount Johnson.
JACQUES-CARTIER,	Strathmore,	Aug. 23,	J. S. A. Ashby,	15 Ave. Lachine.
JOLIETTE, DIV. A,	Joliette,	Sept. 14,	J. O. Guilbault,	Joliette.
JOLIETTE, DIV. B,	St. Jean de Matha,	Sept. 9,	J. O. Léveillé,	St. Jean de Matha.
LAPRAIRIE,	Laprairie,	Sept. 14,	Art. Matte,	St. Constant.

L'ASSOMPTION,	L'Assomption,	Aug. 24,	I. J. A. Marsan,	L'Assomption.
LAVAL,	St. Rose,	Sept. 8,	Jos. Gagnon,	St. Rose.
MASKINONGE,	Louiseville,	Sept. 21,	C. Caron,	Louiseville.
MEGANTIC, DIV. A,	Inverness,	Sept. 16,	J. B. Campbell,	Campbell's Corner.
MEGANTIC, DIV. B,	Plessisville,	Sept. 14,	J. B. Vallée,	Plessisville.
MISSISQUOI,	Bedford,	From Aug. 31 to Sept.2,	C. O. Jones,	Bedford.
MONTCALM,	St. Julienne,	Sept. 21,	J. F. Daniel,	St. Esprit.
MONTMAGNY,	St. Thomas,	Sept. 16,	Alex. Proulx,	Montmagny.
MONTMORENCY, DIV. A,	Riv.-aux-Chiens,	Sept. 30,	J. Cloutier,	Riv.-aux-Chiens.
MONTMORENCY, DIV. B,	St. Famille,	Sept. 21,	E. Létourneau,	St. Famille.
NAPIERVILLE,	St. Remi,	Sept. 9,	Art. Collette,	St. Remi.
NICOLET,	St. Gregoire,	Sept. 7,	N. Levasseur,	St. Angele.
PONTIAC, DIV. A,	Shawville,	Sept. 8-9-10,	R. W. Hodgins,	Shawville.
PONTIAC, DIV. B,	Chapeau,	Sept. 27-28-29,	P. McMahon,	Chapeau.
PORTNEUF, DIV. B,	St. Casimir,	Sept. 8,	J. P. Guertin,	St. Thuribe.
QUEBEC,			J. B. Delage,	54, Bridge St., Que.
RICHELIEU,	St. Victoire,	Sept. 21,	Jos. Desjardins,	St. Victoire.
RICHMOND,	Richmond,	Sept. 16-17,	A. E. Main,	Upper-Melbourne.
RIMOUSKI,	Rimouski,		Zénon Berube,	St. Donat.
ROUVILLE,	Rougemont,	Sept. 21,	A. Arés,	Rougemont.
SHEFFORD,	Waterloo,	Sept. 14-15,	N. O. Rockwell,	Waterloo.
SOULANGES,	Pont Chateau,	Sept. 16,	G. R. Vernier,	Coteau Landing.
STANSTEAD,	Ayer's Cliff,	From Aug. 31 to Sept.2,	H. G. Curtis,	Stanstead.
ST. HYACINTHE,	St. Hyacinthe,	Sept. 14,	Réné Morin,	St. Hyacinthe.
ST. JOHN,	St. John,	Sept. 9,	J. A. Lussier,	St. John,
ST. MAURICE,	St. Barnabé,	Sept, 21,	E. Bellemare,	St. Barnabé.
THREE RIVERS,	Banlieue Three-Rivers,	Sept. 28,	M. Pothier,	Three-Rivers.
TWO MOUNTAINS,	St. Scholastique,	Sept. 20 to 23,	J. Fortier,	St. Scholastique.
VAUDREUIL,	St. Lazare,	Sept. 21,	Jos. Denis,	Vaudreuil.
VERCHERES,	St. Theodosie,	Sept. 16,	J. E. Messier,	Varennes.
WOLFE, No. 1,	Marbleton,		E. J. Westman	Marbleton.
WOLFE, No. 2,	Ham, Nord,	Sept. 14,	E. O'Bready,	Wotton.
WRIGHT,	Aylmer,		R. K. Edey,	Aylmer, box 114.

PROVINCIAL EXHIBITIONS:—

VALLEYFIELD.—August 16 to August 21.
THREE-RIVERS.—August 23 to 28, C. D. Hébert, Three-Rivers.
QUEBEC.—August 28 to Sept. 4, Geo. Morisset, (City Hall).
SHERBROOKE.—Sept. 6 to 11, H. B. Miller, (Sherbrooke).

OSCAR LESSARD,
Secretary of the Council of Agriculture, Quebec.

SILO INSURES THE CORN CROP

Because farmers are thinking "silo" these days the following points as to silos are worth keeping in mind:

The walls must be air-tight.

The walls must be smooth inside.

The best type of silo is round.

The roof should be water-proof.

The structure should be substantial. It has to stand much pressure.

The cost should be from $2 to $5 for each ton of capacity, provided the total capacity is to exceed 100 tons.

A silo 14 feet is diameter and 32 feet high will hold 100 tons.

One hundred tons of silage will feed 25 head of stock for 200 days.

A silo should be placed as near as possible to the place at which the silage is to be fed and should be on the least exposed side or end of the barn.

Any type of good silo is a valuable adjunct to the farm equipment where there is live stock to feed.

Alfalfa skeptics should observe the first crop of alfalfa hay and then note the amount of timothy hay that will be obtained from the same area of land. If they will take into account that three to four cuttings of alfalfa will be secured in a season, that it will resist drouth, and that it contains four times as much protein per hundred as timothy hay, may be these people will get over their skepticism.

Why not plant a few shade trees?

She: Why do they paint the inside of a chicken-coop?" He: "To keep the hens from picking the grain out of the wood."—Lehigh Burr.

The critical period in the young turkey is generally at an end when six weeks of age. Inbreeding, lice, dampness and improper food are the main causes for great mortality.

LIVE STOCK

LOCAL SALES OF PUREBRED SHEEP AND MARKET LAMBS

Under the auspices of the Wool Growers' and Sheep Breeders' Associations

THE executive committees and directors of the eight Wool Growers' and Sheep Breeders' Associations in operation in the province of Quebec have decided that some steps are necessary to facilitate the local purchase, sale and exchange of purebred stock, and market lambs. At meetings held recently for the purpose of discussing a policy in this connection it was decided to hold four local sales. The associations of Compton, Sherbrooke, Stanstead and Richmond counties are holding a joint sale at Sherbrooke. The District of Bedford association is holding a local sale at Cowansville; the Argenteuil county association one at Lachute and the Pontiac association intends selling at Shawville, Campbell's Bay and Waltham.

It is thought that these local sales will provide not only a new and much needed market as well as opportunity for local purchase but also a splendid means of bringing community sheep breeders and their stock together at least once a year. The local breeder who has stock of merit should find ready sale for it and be afforded an opportunity of coming in contact with breeders and stock from other parts of the province, while those who are in need of purebred rams and ewes will have a field for selection of individuals best suited to their requirements.

Members of these associations who have purebred stock for sale should make it a point to contribute largely of their best stock since the success of these sales rests largely with the breeders themselves. Arrangements have been made whereby it is possible to have all purebred flocks inspected by a member of the Animal Husbandry Department of Macdonald College for approval, as it was felt that only animals of real merit should be included in these sales. The sales will be held during the latter part of September and the early part of October.

SOME FLOCKS, HERDS AND FARMS OF THE BEDFORD DISTRICT

I. INTRODUCTORY.

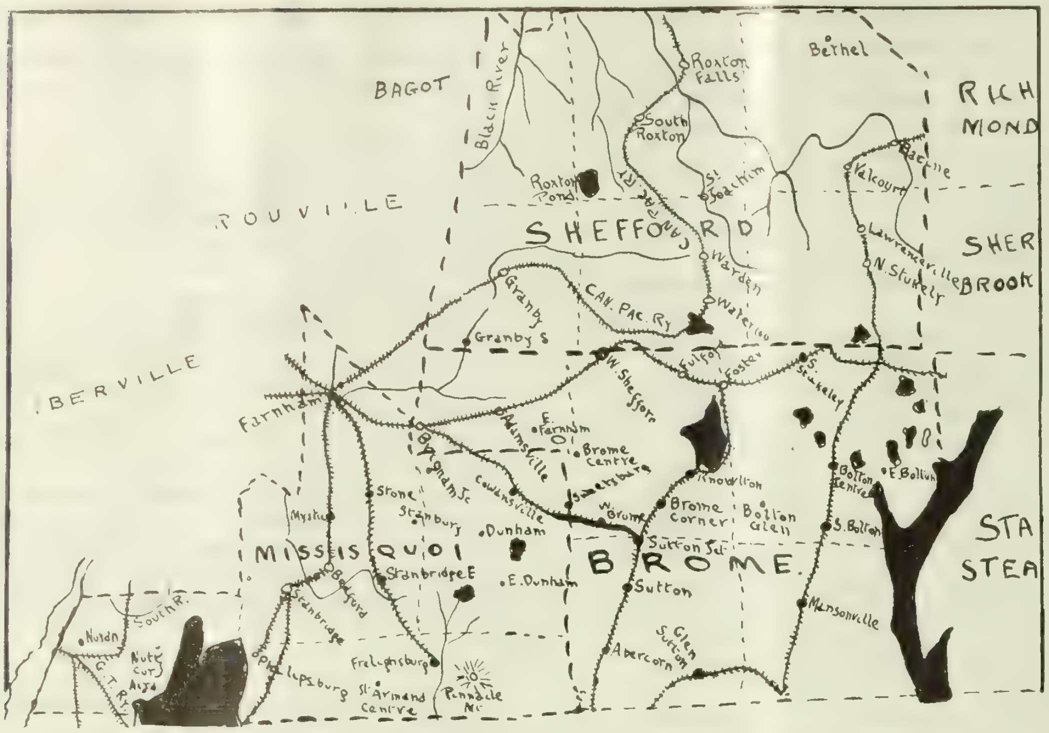
THE judicial district of Bedford includes three of the most fertile and most picturesque of the counties of the Eastern Townships—the counties of Brome, Shefford and Missisquoi. In the present article we purpose giving a brief account of the general agricultural conditions of this important district to be followed in future issues by brief illustrated accounts of some of the typical individual farms.

The counties of Missiquoi and Brome lie on the Vermont border between the two largest lakes of the Appalachian region of the province, Lake Champlain and Lake Memphremagog. Shefford, the largest of the three counties, lies north of Brome. The land of the district is of the type common to the Eastern Townships, alternations of stony hills with fertile, well-watered valleys; a country well adapted to stock-farming, drought being practically unknown.

POPULATION.

Two-thirds of the population of the district is rural, but the district contains also some of the most beautiful of the well-kept towns and villages of the Eastern Townships, towns and villages whose inhabitants must surely be imbued with a genuine public spirit, else their streets would not present so uniform an appearance of neatness and beauty. Missisquoi has two incorporated towns, Farnham and Bedford, and the five incorporated villages of Cowansville, Philipsburg, Dunham, Sweetsburg and Frelighsburg, Shefford has likewise two towns, Granby (the largest town of the district) and Waterloo, and four incorporated villages—Roxton Falls, Ste. Prudentienne, West Shefford and Lawrenceville. Brome, the most sparsely populated of the three counties has the two large incorporated villages of Sutton and Knowlton. Many of these villages are well known to city folk as desirable places of summer residence.

Approximately two-thirds of the population of the district speak the French language, Brome being the only one of the three counties in which the English tongue predominates. One visiting the English speaking farms naturally gets the impression that the English own a larger share of the land than in proportion to their numbers, but whether this is merely an illusion the census returns do not enable one to determine. At any rate



MAP OF THE BEDFORD DISTRICT.

the English evidently bear their share in the agricultural enterprises of the community and work harmoniously with their French-speaking neighbors. The English-speaking population is largely of New England stock.

The following figures are taken from the Census of 1911:—

Population	1901	1911	Increase	Persons per sq. mile. 1911
Brome	13,397	13,216	—181	27
Missisquoi . . .	17,339	17,466	+127	47
Shefford	23,628	23,976	+348	42
Total	54,364	54,658	294	

Distribution	Rural	Urban	Increase since 1901 Rural	Increase since 1901 Urban
Brome	10,758	2,458	— 3	— 178
Missisquoi	10,363	7,103	+ 85	+ 42
Shefford	15,368	8,608	— 1,182	+ 1,530
Total	36,489	18,169	— 1100	+ 1,394

Origin	British	French	Foreign and Unspecified.
Brome	7,759	4,977	480
Missisquoi	5,958	10,479	1,029
Shefford	4,587	19,214	175

AGRICULTURAL INDUSTRIES

The number of farm holdings of over 50 acres in the district is over five thousand. Seven eighths of the land is occupied by the owners and only one eighth is leased or rented. The value of the field crops produced is 1910 was nearly $4,000,000, that of the hay $2,000,000, that of the milk over $2,000,000 and that of the animals sold and slaughtered on the farm about $1,500,000. As these figures indicate, the Bedford district is essentially a dairy farming district. The dairy products are market milk and cream and butter together with a very little cheese. In some parts, especially in the Missisquoi flats, which are refertilized by flooding, hay and grain are marketed in considerable quantity. Prominent among the minor industries are poultry-keeping and sugar-making, about $200,000 worth of eggs, $100,000 worth of poultry and $250,000 worth of maple syrup and sugar being produced annually. Potatoes to the value of $300,000 are produced and orchard fruits to the value of over $100,000.

ORGANIZATIONS.

The farmers of this district are well organized for many of the interests which they have in common. The district of Bedford Dairymen's Association, which meets annually at Cowansville, has been in existence for many years and under the enthusiastic leadership of Mr. H. Sewell Foster of Knowlton has accomplished great things for the dairy interests of the community. The Eastern Townships Dairy Produce Exchange, better known as the Cowansville Butter Board, conducts sales weekly. A Wool Growers' Association was successfdlly organized this year and the sheep men of the district are enthusiastic over its benefits. By the grading and co-operative sale of the wool, prices were realized ranging from 5 to $6\frac{3}{4}$ cents better than those obtained by neighbors who remained out of the organisation. In fact, the prices received by the members for "rejections" were equal to those obtained by outsiders for their whole clip.

Each of the three counties has its Agricultural Association, conducting a good fair. In addition all three counties have Horticultural Associations. In Brome the Agricultural and Horticultural Associations hold a common fair but the Missisquoi Horticultural Association holds a separate fair in Dunham, the Agricultural Association holding its at the county seat, Bedford. The horticultural society of Shefford is known as the "Granby Horticultural Society". This Society is to hold an exhibition in Granby on September 9th and 10th. The Agricultural Associations of Brome and Missisquoi both conduct standing crop competitions. The crop chosen for these competitions in the present year is ensilage corn in both counties. Missisquoi County also holds a Seed Fair in the winter.

There are a number of Farmers' Clubs in the district, one of the most notable being that at West Shefford. This Club keeps for the use of its members a number of pure bred sires including two Ayrshire bulls, one Canadian bull and 12 Chester White boars. Cowansville has had a Cow Testing Association for over ten years.

Mr. Emile A. Lods, Macdonald College Demonstrator at Cowansville.

Homemakers' Clubs have been organized in West Shefford, Waterloo, Cowansville, Dunham and Farnham Centre. Some of these are doing Red Cross work and some are paying particular attention to the improvement of the rural schools.

There is a Macdonald College Extension Branch at Cowansville, with Mr. Emile A. Lods. B. S. A., as demonstrator and Mr. George Hay as assistant

Executive Committee of the Missisquoi Agricultural Society.

Standing: S. Gauthier, Farnham; James Symington Philipsburg; C. O. Jones, Bedford, Secretary; D. Walsh Bedford, President; Harvey Beatty, Stanbridge East, Vice-President; John Pickering, Dunham; R. H. Reynolds, Clarenceville.

Seated: M. J. Bealtee, Stanbury; Edward Shepard, Freligshburg; O. A. Reynolds, St. Armand Centre; J. M. Hill, Nurse's Line; E. H. Morgan, Stanbridge Station.

demonstrator. This office is conducting two school fairs this year, a work in which the demonstrators are cordially supported by the Homemakers' Clubs. The Cowansville School Fair is in its second year, while that at Bedford is being held this year for the first time. Much interest in these competitions is taken by the parents as well as by the children. The Extension Branch is also conducting four experiments with fertilizers and four comparative tests of varieties of ensilage corn.

A representative of the Journal recently had the pleasure of driving through a portion of the district with Mr. Lods, the demonstrator. The drive was confined to the two southern counties and by no means covered the territory of these two counties. It was possible to call at only a few of the farms about Cowansville, Knowlton, Sutton Junction, Stanbridge East and Philipsburg, and no doubt those visited were among the best in their respective neighborhoods. Making all allowances, however, for the existence of poorer farms, one is impressed with the large proportion of modern buildings and with the high quality of the stock, particularly the dairy cattle, of the district. Agriculture is evidently in a healthy condition in the District of Bedford.

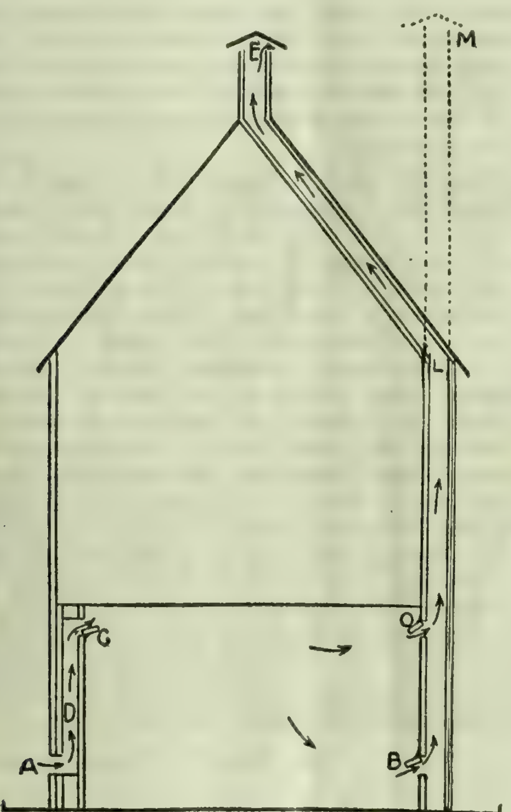
J.F.S.

STABLE VENTILATION

It has been said that a man can go two or three weeks without *food*, two or three days without *water*, but only two or three minutes without *air*. This saying simply emphasizes the importance of pure air in the life of animals. The active constituent of air is oxygen, which makes up one fifth. When this gas is used up in the breathing process and carbonic acid takes its place the body fails to perform its normal functions, and numerous poisonous products are produced which sooner or later cause derangement.

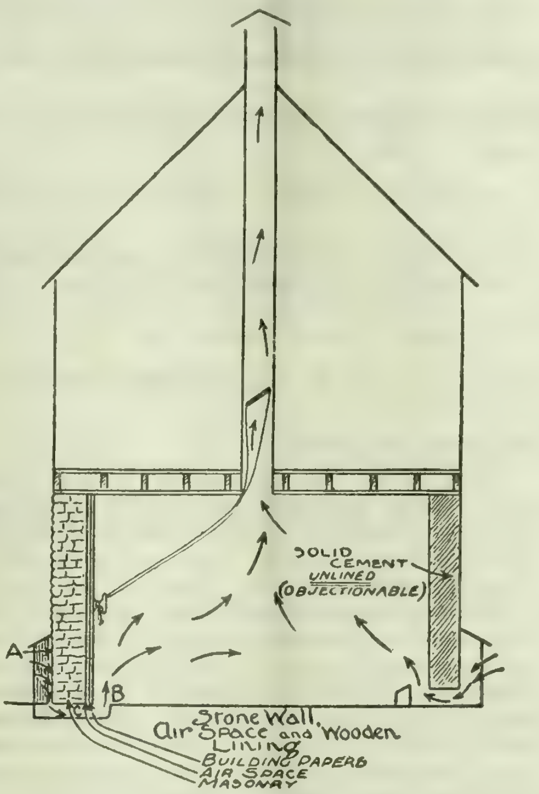
For this reason some system of ventilation should be installed in every stable. It is not sufficient to have only an opening to the outside air. This is better than nothing, but it does not ventilate, that is it does not remove the impure air and bring in fresh air. There should be a proper outlet as well as a proper inlet.

Two systems of ventilation are in use in Quebec—the King system and the Rutherford system. Both have their advocates, and both give excellent results when properly installed. The merit of both systems is their simplicity and ease of construction.



1—The King System

The accompanying diagram (1) shows clearly the distinguishing feature of the King system. The fresh air enters at the ceiling at C. and the foul air is drawn off at B, and passes up a shaft to the ventilator at the top of the building at E. Outlet shafts should be placed at intervals of 10 feet, and each carried up to the top, or all the shafts may run into one central flue.


SOLID CEMENT UNLINED (OBJECTIONABLE)
A
B
Stone Wall, Air Space and Wooden Lining
Building Papers
Air Space
Masonry

2—The Rutherford System.

The Rutherford system (see diagram) differs from the King in the position of the inlets and outlets. The inlets in the former are placed near the floor and the outlet at the ceiling. The circulation of air is more direct, which is said to be an objection by some stockmen. The King advocates say that the foul air is heavier than ordinary air and consequently settles on the floor, and that under winter conditions the cold inlet air, being colder than that inside, will descend; consequently the best place for the outlet is near the floor.

The Rutherford advocates claim that sufficient ventilation occurs by that system, besides it is somewhat easier to instal.

Construction of the Shafts or Flues

The air-shafts should be air-tight. The total cross-section of intake should provide for one square foot for every ten head of stock. The outlets should have double the capacity of the inlet, or two square feet for every ten head. It is advisable to have the inlets on as many sides as possible, and no inlet should be smaller than 4 inches by 10 inches.

Outlets should not be less than 18 inches across. The shaft or flue may be made of lumber or of galvanized iron. If made of lumber they are built with two layers of boards with an air-space between. Some prefer to use tar-felt paper between the two layers of boards.

There are several details of construction which must be attended to in order to get the best results: (1) to have the inlet air of Rutherford system directed upwards so as to prevent a direct draught on the stock; (2) to have the outlet shafts large and as straight as possible; (3) to have dampers or controls on the outlet not on the inlets of the Rutherford system; (4) Stable walls and ceilings to be practically air-tight and non-conductors of heat and cold, the doors and windows fitting well; and (5) outlet shafts to be air-tight and non-conductors of heat and cold.

Farmers intending to introduce a ventilation system should write to the Dominion Experimental Farm, Ottawa, for a bulletin on this subject.

W. L.

OFFICIAL RECORDS OF HOLSTEIN-FRIESIAN COWS

From July 1st to July 31st, 1915

MATURE CLASS

No. and Name of Cow	AGE y.	m.	d.	Milk Lbs.	Fat Lbs.	But. Lbs. 80% Fat	OWNER
1. May Echo Sylvia, 11385...	6	0	6	674.7	29.06	36.33	
Thirty day record	6	0	6	3333.9	118.69	148.36	
Sixty day record	6	0	6	7002.5	227.93	284.92	
Ninety day record	6	0	6	10409.0	327.14	408.92	
120 day record	6	0	6	13568.9	418.86	523.57	A. C. Hardy, Brockville, Ont.
2. Katy Burke Korndyke Pontiac, 15585	5	0	17	554.1	26.49	33.12	
Thirty day record	5	0	17	2365.2	99.71	124.64	H. W. Imerson, Harlem, Ont.
3. Gipsey Queen Rhoda, 28425.	5	2	4	548.8	24.57	30.71	William C. Stevens, Philipsville, Ont.
4. Gipsy Wayne, 12295	6	1	3	543.3	21.31	26.64	Dr. L. de L. Harwood, Vaudreuil, Que.
5. Kate Sylvia, 13727	6	1	21	575.1	21.07	26.34	D. A. McPhee, Vankleek, Hill, Ont.
6. Grebegga 2nd, 11476.	7	1	0	685.3	20.47	25.59	Colony Farm, Essondale, B. C.
7. Curldyke 2nd, 14886..	5	3	2	510.6	19.20	24.00	Colony Farm, Essondale, B. C.
8. Dinah Keyes DeKol, 11101.	7	0	15	544.9	17.58	21.98	W. R. Shield, Mt. Pleasant, Ont.
9. May Queen Wayne G., 15556	5	1	5	544.9	16.49	20.61	Manning, W. Doherty, Malton, Ont.
10. Bell Dillon 17216..	5	2	27	427.1	16.15	20.19	A. C. Hardy, Brockville, Ont.
11. Belle of Whittaker Sadie Vale, 9663..	9	1	30	544.2	16.09	20.11	G. A. Brethen, Norwood, Ont.
12. Faforit 3rd's Lass, 5871.. .	10	8	2	545.5	15.44	19.31	R. F. Hicks, Newton Brook, Ont.
13. Verona, 6419..	10	1	5	468.3	15.38	19.22	Colony Farm, Essondale, B. C.
14. Leone Pietertje Mercedes, 7108..	9	5	13	471.1	15.19	18.99	J. A. Wallace, Simcoe, Ont.
15. Polly Jane Posch, 13438...	5	11	25	470.7	15.00	18.76	Jesse Looker, Mitchell, Ont.
16. Beauty of O. A. C. 3rd, 16915..	5	4	28	440.9	14.66	18.33	Ont. Agricul. College, Guelph, Ont.

JUNIOR FOUR YEAR CLASS

No. and Name of Cow	AGE y.	m.	d.	Milk Lbs.	Fat Lbs.	But. Lbs. 80% Fat	OWNER
1. Colony Wadmantje Princess, 21895..	4	2	14	459.8	18.78	23.47	Colony Farm, Essondale, B. C.

2. Elmbank Faforit, 20135...	4	2	11	401.7	14.78	18.46	C. Slavin, Malton, Ont.
3. Johanna Faforit, 20734. ..	4	2	17	441.4	12.72	15.90	C. Slavin, Malton, Ont.
SENIOR THREE YEAR CLASS							
1. Orma of Crystal Spring, 25760..	3	10	8	400.9	14.55	18.19	D. A. McPhee, Vankleek, Hill, Ont.
2. Cloverleaf Korndyke Susie, 15836..	3	10	21	393.2	12.72	15.91	A.E. Smith & Son, Millgrove, Ont.
3. Lady Creamelle 20895.. ..	3	11	20	328.1	12.10	15.13	W. W. Holtby, Port Perry, Ont.
JUNIOR THREE YEAR CLASS							
1. Mercedes Pietje Netherland, 23227..	3	4	16	475.7	20.19	25.24	William C. Stevens, Philipsville Ont.
2. Cora Hengerveld Korndyke, 20755	3	2	29	478.8	17.24	21.55	D. A. McPhee, Vankleek, Hill, Ont.
3. Lakeview Dutchland Queen, 21115..	3	3	5	510.0	14.41	18.02	Lakeview Farm, Bronte, Ont.
SENIOR TWO YEAR CLASS							
1. Sadie Mac, 22306..	2	11	14	438.1	16.47	20.59	D. A. McPhee, Vankleek, Hill, Ont.
2. Francy Queen Ormsby, 22299	2	6	12	463.3	14.59	18.24	Dr. L. de L. Harwood, Vaudreuil, Que.
3. Pontiac Maida, 25618.. ...	2	6	3	294.6	13.15	16.44	A. C. Hardy, Brockville, Ont.
4. Inka Josephine DeKol 2nd A., 36139..	2	11	25	320.0	10.70	13.38	C. Slavin, Malton, Ont.

W. A. CLEMONS, Secretary

MILKING RECORDS OF PURE BRED COWS

NINE years ago the Live Stock Branch of the federal Department of Agriculture, in co-operation with certain record associations representing breeds of dairy cattle, began to record the performance of pure bred milking cows. Each record association agreed upon a standard of yield for cows of its respective breed to qualify for registration, while the Live Stock Commissioner formulated regulations under which the tests were to be carried out. At the end of each year a report of the work has been issued, containing a list of the animals that qualified for registration during the year, their breed, age, ownership, milking period, production of milk and fat and such other information as might reasonably be looked for in an official report. Each year the work has increased until the seventh report, just issued, contains no less than 152 pages of information. During the year 413 cows qualified for registration, including 196 Holstein, 123 Ayrshires, 35 Jerseys, 9 Guernseys, 14 French Canadians and 36 Shorthorns. The highest records made were:— Shorthorn 15,535 lbs. milk, 540 lbs. fat; French Canadian, 10,767 lbs. milk, 453 lbs. fat; Guernsey, 11,445 lbs. milk, 520 lbs. fat; Holstein, 23,717 lbs. milk, 834 lbs. fat; Jersey, 15,211 lbs. milk, 754 lbs. fat; Ayrshire, 16,696 lbs. milk, 729 lbs. fat.

This report for the second time contains an appendix containing the records of cows which produced sufficient milk and fat to qualify for registration but failed to calve within fifteen months after the commencement of the test, as required by the registrations. This report is of special interest to dairy farmers who are anxious to build up the milking qualities of their herds. Copies will be sent to those who apply for them to the Publications Branch of the Department of Agriculture at Ottawa.

DOGS AND FARM SHEEP

THE number of sheep in the 36 farm States, which do not include any of the western division, could be increased by 150 per cent, it is estimated, without displacing other live stock. Some authorities believe that the increase could be even as much as 500 per cent without serious interference with the number of other animals. An increase of 150 per cent in these 36 States would mean in money $144,267,000. In a new publication of the Department, Farmers' Bulletin 652, the responsibility for this loss to the country is laid upon the sheep-killing dog.

Sheep-killing dogs, it is said, are the principal cause of the marked decrease in the numbers of sheep on American farms. In the ten years between 1900 and 1910 the number of sheep in the country, exclusive of the States in the western division, decreased 3,900,000 head, in face of the fact that during these same years the market value of sheep rose so rapidly that the total value of sheep in this area was $19,000,000 or approximately 25 per cent more in 1910 than in 1900. Favourable though the market conditions were, they were not a sufficient incentive to induce farmers to risk the heavy losses from stray dogs.

The number of sheep killed annually by dogs can not be stated exactly, since there are many cases which are not reported at all. Judging from the figures in those countries and States in which reasonably complete reports are obtainable, however, it may be said that in the 36 farm States more than 100,000 sheep are killed each year by dogs. This, it is true, is less than 1 per cent of the total number of sheep in this area, but a 1 per cent loss on a business that is being conducted on a profit basis of 5 or 6 per cent cannot be ignored. This estimate, it must be remembered, is also probably much lower than the actual figures. It is certain, too, that many men have been kept out of the sheep business through fear that in their own particular cases the loss would be much more than 1 per cent. Anyone who has actually seen sheep killed, injured, or frightened by dogs is likely to think twice before engaging in the business. In many cases while only 1 or 2 sheep may be actually bitten by the dogs, the whole flock is chased until it dies from exhaustion.

If the dog question could be satisfactorily disposed of, there seems to be no reason why the number of sheep in the country could not be increased to the extent already indicated. In Great Britain there is one sheep or lamb for each 2-5 acres of the total area. In the 36 farm States in this country there is 1 sheep or lamb for each 31-8 acres. The British farmer handles his land on an intensive basis and feeds his sheep on forage-crop pasture. Such pastures not only increase the fertility of the land but also free the sheep from many internal parasites contracted through grazing upon permanent pastures. In particular the use of a succession of forage crop pastures will prevent stomach worms, one of the most prevalent and disastrous scourges of young stock, and will enable the farmer to market by the end of June or the first of July, when market prices are usually the highest, the lambs that were born in the late winter or early spring. Handled under such conditions and on high-priced farm land, the importance of a small flock of sheep can not be overlooked.

In addition to pointing out these facts the bulletin already mentioned, "The Sheep-Killing Dog," discusses the possible means of preventing in the future the loss from dogs. At the present time the various State laws on this subject differ widely, some States using the money obtained from dog licences to reimburse sheep owners, while others permit the sheepmen to recover damages from the dog owners, and two offer them no recourse whatever. Dogs, however, are very seldom caught in the act of killing sheep. It is always difficult to determine their owners, and where the damages are paid by the State directly from the dog-tax funds the money very frequently is far from sufficient to meet all the claims.

A remedy that is suggested for this situation is a uniform State dog law embodying the principle of a tax upon dogs sufficiently heavy to discourage those who are not willing to take care of their pets from keeping them. Under this plan all dogs over 6 months of age must be licensed each year, the tax paid at the time of licensing and a metal tag bearing the license number attached to the dog's collar. Any dog found without this tag unattended and off its owner's premises may be killed. When found unattended on a farm where sheep are kept the dog may be killed whether it has the tag or not, and under any circumstances a dog caught chasing or killing sheep may be killed. All dogs which can be proved to be sheep killers must be killed whether caught in the act or not, and a reward of $15 should be offered for anyone indentifying a sheep-killing dog. The money received from dog taxes should be devoted to reimbursing sheep owners for their lost stock, and the county should in turn recover this money whenever possible from the dog's owner. A special licence should be issued for kennels where large numbers of dogs are maintained under such conditions that they can not possibly do any harm to neighbouring flocks.

While some such plan as this is probably indispensable to the full development of the sheep industry in the United States, there are cases where the flock master will find in its absence the use of dog-proof fences very desirable. The grazing of sheep upon comparatively small areas of land sown to forage crops, instead of upon permanent pastures in larger fields, materially reduces the area to be fenced and makes this a practicable precaution. In the West fences have been built which prove a satisfactory defence against coyotes, and the fence that will turn aside a coyote will turn a dog. A fence of this character can be built as follows:—

Posts 7½ feet in length, set 2½ feet in the ground and 16 feet apart, a barbed wire stretched flat to the surface of the ground; 3 inches higher, a 36 inch woven-wire fence having a 4-inch triangular mesh; 5 inches higher, a barbed wire; 6 inches higher, a second barbed wire; 7 inches above this, a third barbed wire. Total height, 57 inches.

It is important to remember, however, that the bottom strand of barbed wire must be stretched flat on the surface of the ground at all points. If necessary, the ground should be graded before the fence is built. Thereafter such small holes as appear may be filled in. It is not always necessary to fence the entire pasture, for dogs usually attack sheep at night only. If a sufficient area can be fenced to give the flock protection during the night, they may be safely left in uninclosed pastures through the day. This method involves a certain loss of time is driving the sheep to and from the inclosure, but in many cases will be preferred to the expense of fencing on a large scale.

New Letter U. S. Dept. of Agric.

AUCTION SALE

OF

200 SHEEP, 100 SWINE and 100 CATTLE

(Males and Females) All Pure Bred and Registered

ORGANIZED BY THE

GENERAL STOCK BREEDERS' ASSOCIATION

OF THE PROVINCE OF QUEBEC

UNDER THE PATRONAGE AND WITH THE FINANCIAL HELP OF THE

Hon. J. E. CARON, Minister of Agriculture of the Province of Quebec

---

AT MONTREAL

AT THE DELORIMIER PARK

At 10 A. M.

WEDNESDAY, 13th October, 1915

AT QUEBEC

On the Exhibition Ground, At 10 A. M.

WEDNESDAY, 20th OCTOBER, 1915

The animals offered for sale will be registered in the Canadian National Records. There will be some Canadian, Ayrshire and Holstein cattle; some Leicester, Cotswold, Lincoln, Shropshire, Hampshire and Oxford sheep and some Yorkshire, Berkshire, Chester and Tamworth swine.

CONDITIONS:—Cash, except to Farmers' Club and Agricultural Societies which will be allowed time on terms that will be given by the Department of Agriculture of Quebec.

Purchasers assume all responsibility from the moment the animals have been adjudged to them. For further particulars apply to:—

J. A. COUTURE, Secretary of Stock Breeders' Association

49 GARDEN STREET, QUEBEC.

THE DAIRY

THE MANUS MILKING MACHINE

THE different makes of milking machine for sale in Canada are increasing daily and lately several of the more important manufacturers in Europe have decided to enter the Canadian field. A farmer suddenly confronted by a clever salesman exhibiting a beautiful piece of machinery and flourishing dozens of testimonials has very little chance of judging the merits of the particular brand of milking machine. It is for this reason that we introduce to readers of the Journal a milking machine which will be on sale in the near future. The photographs will show that the Manus milking machine is quite similar to the Amo milking machine described in the July number of the Journal, and its home is also in Sweden.

The latest type, the Manus III, works on the combined pressure suction principle. The construction is very simple and practical, and we can draw attention to the following good points:—

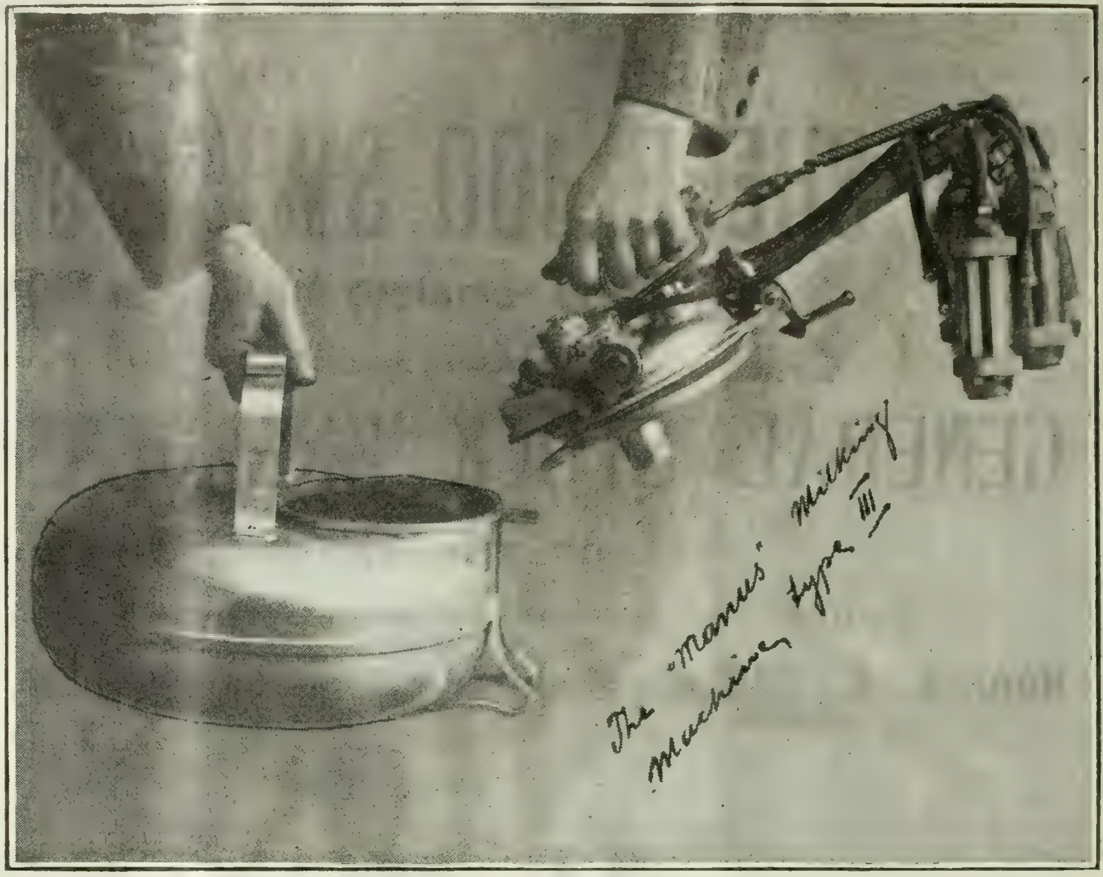
1. All working parts are mounted on the lid of the milk receiver, so that these parts are well protected against damage during milking, and further by this arrangement the emptying and cleaning of the receiver is much facilitated.
2. The four teat cups are connected by means of short rubber tubes with a celluloid tube, through which the milk is conveyed to the receiver.

This arrangement is a decided improvement on the machine with all-rubber connections, although the Amo machine mentioned before has succeeded in doing away with the rubber tubing altogether.

The celluloid tube is held up in a standing position facilitating the milk flow towards the pail. Also in case one of the teat cups drops off the vacuum closes automatically so that no foul stable air can enter the machine and there is no interference with the working of the other teat cups.

In a later number we shall give a more detailed description of this machine, which has the advantage that it is cheaper than some of its American competitors.

J. VANDERLECK



The Manus Milking Machine.

PRODUCING CITY MILK PROFITABLY

W. F. Stephen, Huntingdon, Que.

THE great problem of the successful milk producer is the earning of a profit. This is no easy task when the producer is surrounded with present day regulations, where he endeavors to meet them and at prices now being paid by city retailers. The cost of feeds, cows, and labor has so increased that there is a very small margin between profit and loss, if any in many cases, even at the prices paid by Ottawa dealers, which are the largest paid by dealers in any city in eastern Canada for reasons I will give.

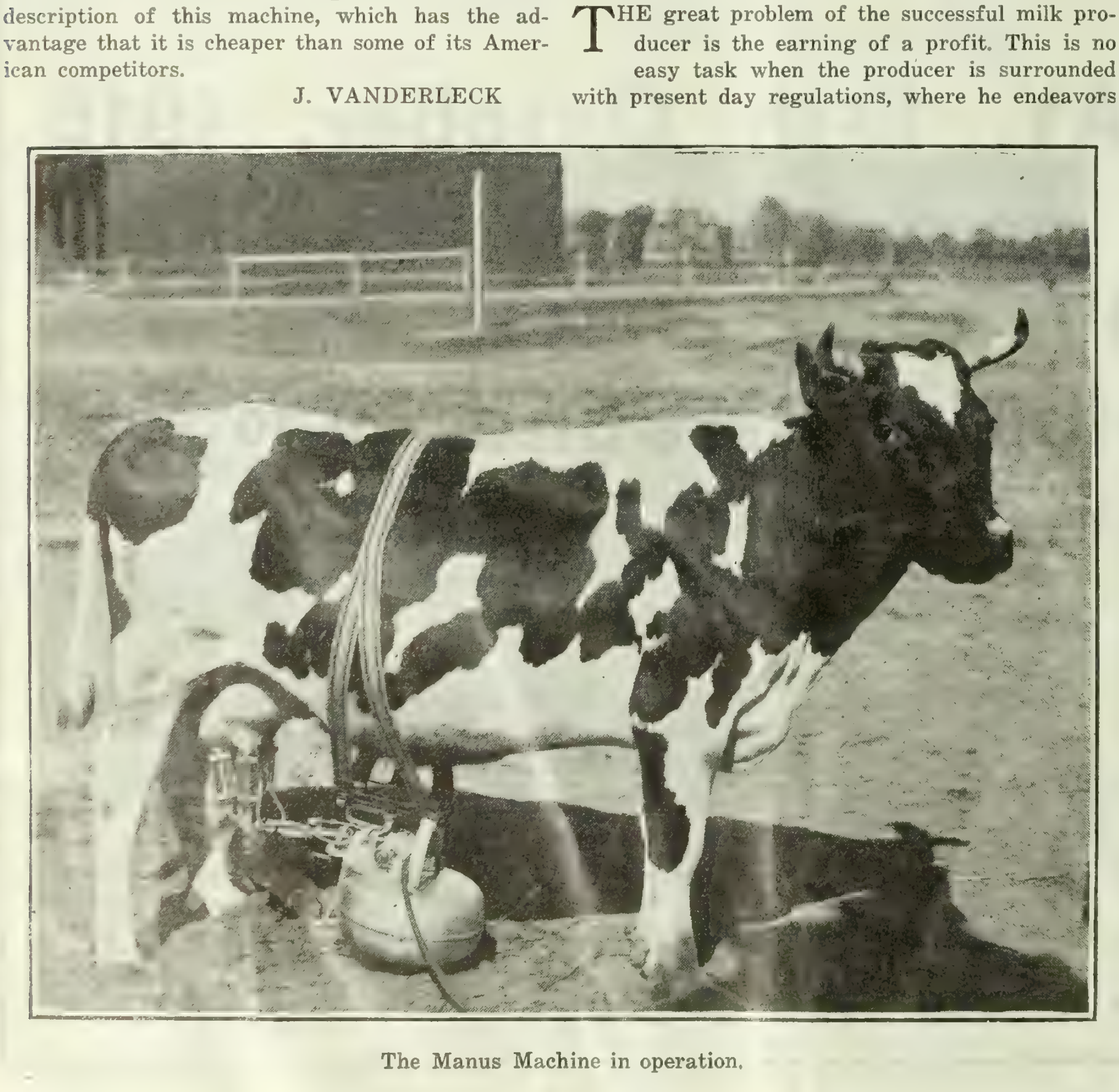
Ottawa dealers pay $1.70 a cwt in summer and $2 in winter at the Farmers' Dairy. Montreal dealers pay $1.30 in summer and $1.90 in winter. Much of the milk is sold for less. Which gets the best milk? Ottawa, to be sure. Nearly all the business in Ottawa is handled by one large firm, who do it most economically. They have a cash system, pay the producers more, and sell a better and purer milk for less money than is sold in any city in Canada.

Montreal has a wasteful system of delivery. Numerous large and small retailers crossing and recrossing each other's tracks many times daily, competing against each other and selling for credit, thus meeting many losses, which ultimately come out of the producer.

The Essentials to Profit

Briefly the essentials to profit in the production of market milk are as follows: Not too expensive land, and not too much capital tied up in buildings. Stables may be comfortable, convenient and sanitary without being too costly. There should be some well-defined plan of work whereby labor may be economized. Labor-saving implements can be used to advantage, but the farmer must avoid locking up too much capital in implements and machinery. Frequently it is cheaper to hire implements and horses than purchase them.

In order to produce milk economically it is essential to have a system of rotation of crops that will give the highest maximum yield per acre of roughage, as well as produce grain at the least cost. No farmer can produce milk cheaply without some succulent ration for winter feeding, such as roots and corn silage. Protein is the costly element in food required for the production of milk. It is



The Manus Machine in operation.

cheaper to raise this in the form of clovers and alfalfa than purchase it in concentrated form. I know something about milk and cream production, as I followed the business actively for 20 years, and I endeavored to raise as much nitrogenous fodder as possible. When this part of the ration has to be purchased, buy the foods containing the largest per cent. of protein that you can get for the least money and consistent with the other elements in the ration.

An Individual Problem

These are problems peculiar to every dairyman, and he must study and work them out for himself. He may observe business principles and conduct his business according to the conditions under which he labors. The producer may have all the foregoing worked out to a successful completion, and yet miserably fail as regards profit, if he has not a good business herd of cows.

Clean milk and big prices are all very well, and sound like profit-making, but if each individual cow in the herd does not give a large and steady flow of milk at a minimum cost of feed, the profits are not what they should be. The day of the 4,000 or 5,000 pound cow is gone, for the successful milk producer. His herd must be composed of cows having a capacity of not less than 7,000 to 10,000 pounds of milk a year. Not more cows, but better cows, would enable the milk producer to better meet present day regulations and conditions. This is the pivot on which turns the wheel of success for the producer of milk for city consumption.

THE IMPROVEMENT OF CREAMERY BUTTER IN QUEBEC

By J. D. Leclair, General Inspector of Creameries

THE Dairy School of St. Hyacinthe was established in 1893 by the Dairymen's Association of the province of Quebec. It was intended to take the place, as a permanent structure, of the travelling school of about the same kind which had been operating for some years previously.

By special understanding with the association, the management of the institution was at first assumed by Professor Jas. W. Robertson, who kept it during three years. As soon as the school was in good working order, the management of it was handed over to the Dairymen's Association.

For the last few years the school has been under the direction of the provincial Department of Agriculture, which has assumed the whole management.

One of the first objects of the school was to make an investigation into the condition of the cheese and butter industry in Quebec, to ascertain the distance between our producers and the best known producers in competitive countries.

The methods in use elsewhere were introduced and generalized in the province of Quebec, with the necessary modifications, only after their suitability to our local conditions had been carefully ascertained.

The St. Hyacinthe dairy school has never introduced and recommended a new method without first securing the opinion of Montreal dealers, based on the quality of the products obtained. Of course this mode of proceeding was necessarily slow, but it saved a great many false steps, and prevented too hasty or unfavourable impressions.

TEACHING PASTEURIZATION

Since 1907 the provincial dairy school of St. Hyacinthe has officially recommended the pasteurization of cream as a necessary purifying process before this cream is manufactured into butter. Pasteurization checks the growth of undesirable germs and creates a more favourable medium for the action of lactic ferments called "pure culture ferments."

Butter makers following the short winter courses have been taught along these lines. They have seen the results attending this method; they have learned how to apply it, and it is now very gratifying to us to see that pasteurization is applied in all new factories and introduced in a great many old ones.

QUALIFICATION OF MAKERS

As the value of the teaching given by the St. Hyacinthe dairy school became known among the public interested in the improvement of dairy produce, some guarantee of competence and skill in the makers was urgently asked, and measures were taken by the school to satisfy these very legitimate requirements.

The school has a board of examiners who are sitting almost continuously during the winter courses; the makers are submitted to a written and verbal examination and to a practical test regarding the testing of milk and cream. When these makers are doing practical work during the season, delegates are sent by this board to see them at work and to find out to what extent they apply the teachings of the school. The granting of the maker's diploma will depend upon this visit. If the practical work does not correspond to the result of the written examination, or vice versa, the maker does not receive his diploma. An unsuccessful applicant may, however, try a second or even a third examination.

Makers who show unwillingness to comply with instructions, who are guilty of habitual negligence, or who do not observe the law and regulations, are struck out of the list of qualified makers, and their licenses and diplomas are withdrawn on the recommendation of the board of examiners by whom they were given. A list of such withdrawals is prepared every year and published far and wide for the knowledge of the public.

THE PART PLAYED BY THE INSPECTOR

Of course the results obtained up to this day cannot be entirely attributed to the teachings of the St. Hyacinthe dairy school, but are also due to the system of factory inspection which has been operating for over twenty-five years in Quebec. Inspectors who are appointed from the best makers to visit the factories closely watch the various processes of manufacture, and, when required, demonstrate the value of the methods taught at the dairy school. This teaching, this supervision, and these demonstrations, have contributed to the general dissemination of the same methods in all parts of the province, and the uniformity which has been the result of this work is a matter for surprise to all dealers visiting our country.

Inspectors had something else to do than to take up the technicalities in the making of butter and cheese. A new and uncontrolled industry is bound to develop some objectionable practices, which, sooner or later, are declared to be abuses. Our dairying industry had to suffer from these mistakes. Owing to its intimate connection with domestic industries, it was the scene of serious abuses, to a larger extent, perhaps, than in other industries, and these abuses very firmly implanted themselves.

Chief among these abuses is the extraordinary number of buildings used for the making of butter and cheese, a great many of which are necessarily poorly equipped and poorly built. The inspectors having been created health officers by a provincial law, they make themselves familiar with the regulations of the provincial health board concerning the sanitation of such buildings, and the good effect of their work is soon felt. These special regulations provide for the washing of the utensils, for the cleaning of contaminated places, for the collection of all residual waters, and the removal of these waters according to the permeability of the soil and slope of the surface.

By-products returned to the farm must be pasteurized.

REGISTRATION OF FACTORIES

All butter and cheese factories must apply for registration to the Department of Agriculture and provide a certified statement regarding their situation. A factory applying for registration is visited by an inspector, who makes a statement of the quantity of milk that is likely to be received, of the suitability of its plant and equipment, and grants registration if the conditions are judged satisfactory.

PREVENTIVE MEASURES AGAINST ABUSES

The "gathered-cream system" has given rise to abuses which are not perhaps so bad in the province of Quebec as in the United States, or possibly in the western provinces; but human nature is about the same everywhere, and it has been judged necessary to take preventive measures against these abuses and to correct them.

The amendment to the factory law (a synopsis of which was published in the May issue of the Journal of Agriculture) contains a summary of the first measures which, in our estimation, will show the dairymen that they are branching off in a wrong direction. It will not be necessary to reproduce this amendment. I want to point out, however, that the general inspector is authorized by this law to make regulations with a view to obtain the desired result. These regulations, which were sent with a copy of the amendment to all butter and cheese factories of the province, were published in the Aug. 1st issue of the Journal of Agriculture.

THE SEARCH-LIGHTS

(By Alfred Noyes, in the "Times", London.)

('Political morality differs from individual morality, because there is no power above the State.'—General von Bernhardi.)

Shadow by shadow, stript for fight,
The lean black cruisers search the sea.
Night long their level shafts of light
Revolve and find no enemy.
Only they know each leaping wave
May hide the lightning and their grave:

And, in the land they guard so well,
Is there no silent watch to keep?
An age is dying; and the bell
Rings midnight on a vaster deep;
But over all its waves once more
The search-lights move from shore to shore:

And captains that we thought were dead,
And dreamers that we thought were dumb,
And voices that we thought were fled
Arise and call us, and we come:
And 'Search in thine own soul,' they cry,
'For there, too, lurks thine enemy.'

Search for the foe in thine own soul,
The sloth, the intellectual pride,
The trivial jest that veils the goal
For which our fathers lived and died;
The lawless dreams, the cynic art,
That rend thy nobler self apart.

Not far, not far into the night
These level swords of light can pierce:
Yet for her faith does England fight,
Her faith in this our universe.
Believing Truth and Justice draw
From founts of everlasting law.

Therefore a Power above the State,
The unconquerable Power, returns.
The fire, the fire that made her great,
Once more upon her altar burns.
Once more, redeemed and healed and whole,
She moves to the Eternal Goal.

POULTRY

OFFICERS OF THE AMERICAN ASSOCIATION OF INSTRUCTORS AND INVESTIGATORS IN POULTRY HUSBANDRY

THE following officers were elected at the 7th. Annual Meeting of the Association, held at the Connecticut Agricultural College, Storrs, Conn., on August 2nd, 3rd, and 4th., 1915:—

President:—M. A. Jull, Macdonald College, P. Q. Can.

1st. Vice-President:—Dr. H. D. Goodale, Massachusett Agric. College, Amherst, Mass.

2nd. Vice-President:—Prof. A. G. Philips, Purdue Agric. College, Lafayette, Ind.

Secretary-Treasurer: — Prof. H. R. Lewis, New Jersey Agric. College, New Brunswick, N.J.

Directors for 1914-1916:—

Dr. Raymond Pearl, Maine Exp. Station, Orono, Maine;

F. C. Elford, Central Experimental Farm, Ottawa, Ont.

Prof. J. C. Graham, Massachusett Agric. College, Amherst, Mass.

Directors for 1915-1917:—

Prof. W. R. Graham, O.A.C., Guelph, Ont.

Prof. W. F. Kirkpatrick, Connecticut Agric. College, Storrs, Conn.

Publication Committee:—

Dr. Raymond Pearl, Orono, Maine.

Prof. Jas. E. Rice, New York Agric. College Ithaca, N.Y.

LOOKING FORWARD

THE condition of the poultry industry in Canada at present is an excellent criterion of future development and those factors and influences which have affected the development of the industry during the past few years will operate in a more extensive way in the next decade in the development of a national poultry industry. Up to the eventful August of 1914 the industry had been developing rapidly and good profits were being made in the production of eggs and poultry flesh. Since the outbreak of the war conditions have not been so healthy and in many cases profits in production have been reduced to the minimum. Prices on many poultry feeds have risen abnormally, though the prices on eggs and dressed poultry have remained normal. It is doubtful if we are much more than breaking even in egg production at present, and many will remember the situation in the dressed poultry trade last autumn caused by the large supplies of dressed poultry in storage accompanied by low prices for last year's crop. Then, too, we must reflect on poultry conditions in the United States in the past two or three years during which time several of the large supply houses failed.

The preceding remarks may fill the reader with pessimism, but one should read between the lines to understand the significance of the real situation wherein lies the hope of the future. Notwithstanding the hardships which our poultry industry is experiencing at present we believe it will develop more rapidly and more substantially than ever before. The effects of the world war have visited the poultry producers of our country, but with every curse there comes a blessing and the result will be that in future we shall practice greater economy in producing and greater efficiency in marketing. The comparatively low profits now obtaining have compelled us to weed out many hitherto unprofitable fowls and to exercise more care in the production and marketing of eggs and dressed poultry; many undesirable features in the poultry industry have been eliminated. All this will be for the benefit of the future.

The poultry industry is bound to expand and develop, if for no other reason than to supply the increased demand in Canada for poultry products. It is probable that our urban population will increase rapidly after the close of the war and this with an increased per capita consumption will give a stimulus to increased production. Finally, the good profits obtained in poultry keeping under proper conditions will do much to increase the number of fowls kept in the country. Thus, the hope of the future lies in a bigger and better industry. In a brief article it is impossible to deal in detail with the existing conditions of the industry; it is intended here that a few suggestions may be made regarding the organization and development of the industry. The writer's chief interest is in larger profits to the producers, and these will be realized if the poultry industry is organized somewhat upon the lines discussed subsequently.

STOCK IMPROVEMENT.

Considered in the broader sense it is quite evident that progress has been made in making poultry-raising more profitable; the average egg-production of Canadian farm hens is higher than was the case ten years ago, but it is due to the introduction of improved breeds and better methods of management rather than to selection in breeding. Selection through trap nesting has been practiced for a number of years but the averages realized in large flocks are very little above what they were at the beginning. This tends to show that there is apparently something wrong with our methods of breeding and there is no aspect of poultry husbandry that demands more attention. Improvement in egg production through better methods of breeding is the basis upon which the most substantial progress will be made in the future.

Apart from the comparatively small amount of trap-nesting practiced throughout the country, practically no systematic breeding is done. Mass selection, as practiced by many farmers and poultry breeders, accomplished but little toward increased egg production. The great problem, then, is to originate some scheme toward improving the stock of the country which will give the desired results. In this matter there are few precedents in other countries to follow.

The Board of Agriculture for Scotland has inaugurated a scheme for the distribution of settings of eggs of pure breeds of poultry with a view to improving the flocks of the poorer sections of the country. The Department of Agriculture in Ireland has adopted practically the same scheme to improve the poultry industry there. The essential feature of these schemes is the bonusing of a number of approved applicants, called station-holders, who are prepared on special terms provided to distribute eggs for hatching purposes from approved breeds at one shilling per sitting, 12 eggs to count as a sitting. Station-holders are selected within a minimum radius of three miles who agree to comply with certain requirements, the more general of which are:—

1. Provide and maintain for station purposes at least thirty hens of one breed only, the hens to be marked with numbered and sealed rings by an official of the Board, or of the Agricultural College of the district, before the commencement of the season;
2. Replace each year at least one third of the hens with early hatched pullets;
3. Provide such housing, run and general management as the Board or the College may require;
4. Dispose of any birds on the premises of which the Board or College may not approve and neither keep, mate nor bring on the premises during the distributing season any poultry without the sanction of the Board of the College.
5. Supply sittings of eggs from station birds at the fixed price of one shilling per sitting from January 1st to 31st to any person in the area of distribution which is the county.
6. Limit each applicant to one sitting at any time when the demand for eggs exceeds the supply;
7. Stamp all eggs given out with the stamp provided by the Board;
8. Allow inspection of the station at any time by an official of the Board or of the Agricultural college.

Mr. Edward Brown, the prominent English poultry authority, has informed us that "in selecting the stock for use under the poultry scheme special attention is paid to the quality of the birds in regard to racial character and productiveness. The selection of birds at the stations is carried out on the following lines:—The Instructor each season goes through the stock, marking with sealed leg bands the birds selected for station purposes. The pullets are generally the produce of the station stock and male birds are procured each year from other stations or from private breeders. Every care is taken to provide male birds from reliable strains. A high utility standard is maintained both as regards type and utility standard. This scheme does much to improve the quality of the stock of the country and in that way an increase in egg production results. It is a scheme which should receive the serious consideration of poultry authorities in this country.

Another scheme worthy of application to conditions in Canada is that employed in Denmark. In different parts of Denmark breeding centres have been established where special attention is given to the trap-nesting of the birds and to the selection and mating of the breeding stock for egg production. Breeding stock and eggs for hatching are sold from these centres to the surrounding farmers at reduced prices. A number of stations adopt a system of exchange of breeding stock, thus obviating the necessity of introducing blood from outside sources.

Practically the only work along the above lines which has been carried out in this country is the distribution of hatching eggs to school children, as practiced in Nova Scotia, Quebec, Ontario and Manitoba. While one of the fundamental objects of this extension work on the part of the Colleges is the improvement of the poultry industry, it also secures practical results in greater interest in poultry raising, improvement in breeding in the various districts and provides for the establishment of community breeding centres. Apart from the economic returns the feature is distinctly educational, since it brings the pupils in direct contact with the underlying principles in the production of a staple agricultural product.

The distribution of hatching eggs to rural school children is a good line of work but it does not go far enough. Some effort should be made to establish community breeding centres in those districts where eggs are distributed. Then something definite and tangible could be done through breeding and selection and more rapid improvement would result.

It seems to us that the Federal Government, through the Experimental Farms, and the Agricultural Colleges of the Dominion are responsible in a large measure for the improvement in the productive qualities of the stock of the country. Let them see to it that community breeding centres are established, coupled with a systematic line of work in breeding and distribution of improved stock. It is quite obvious that there should be cooperation between the farms and the colleges.

The above line of work might well be supplemented by a scheme originated by the Poultry Division of the Live Stock Branch of the Dominion Department of Agriculture with a view to encouraging the more general breeding of highclass utility poultry based upon a system of pedigree of merit. The plan outlined by the Poultry Division provides for the selection of suitable farms as official breeding plants for the breeding of certified male birds. A standard of merit would be adopted including the requirements of the Standard of Perfection as regards purity of breeding, the health and vigour of the stock, the winter egg production of the pullets, the fertility and hatchability of the eggs, the rate of maturity and extent of mortality in the young stock, and other matters conducive to the maintaining of the maximum standard of productivity. Upon the official inspection of the breeding plants those plants which fulfilled the standard requirements would be in a position to offer male birds eligible for registry and which would be provided with certificates of merit. In case of sale the registered male birds would be provided with transfer slips, and all records regarding the breeding of the birds and outlining the conditions under which they are officially recognised would be kept on file in the office of the Poultry Division. So far as the writer is aware this scheme is far in advance of anything yet proposed in poultry breeding work and it is deserving of the most careful consideration on the part of all poultrymen.

M. A. JULL,

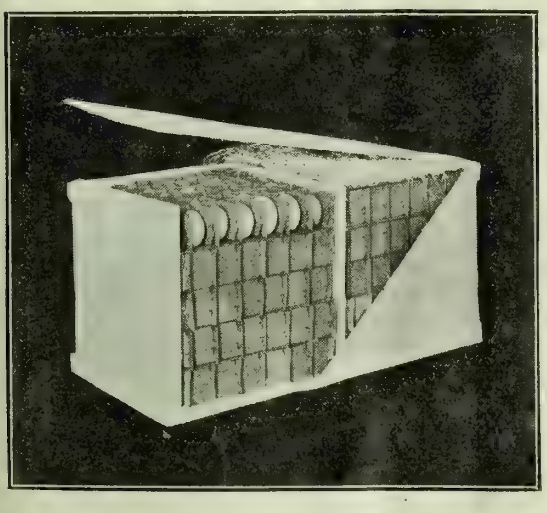
Poultry Department,

Macdonald College.

EGG CIRCLES IN QUEBEC

THE following table gives the quarterly report for the months of April, May and June 1915, of the ten Egg Circles which are in operation in the Province of Quebec.

Egg Circle.	No. of members.	No. of weekly shipments.	No. of doz. of eggs shipped.	Avg. price per doz.	Gross returns to divide.	Net returns to members.
Ayer's Cliff	60	12	4838	21.28	1029.52	896.32
Coaticook	7	4	450	20	90.00	85.50
Dunham	11	12	1590	21.63	343.95	284.70
Elmside	24	13	3270	19.7	645.34	607.39
Fitch Bay	20	13	1764	20.54	362.45	321.12
Hemmingford	17	13	1612	20.68	333.42	311.95
North Hatley	20	14	1620	20.37	330.00	273.65
Shawville	80	13	13940	20.37	2797.60	2616.90
Smith Mills	9	13	1050	26.2	216.51	197.69
Wyman	19	13	1989	20.28	403.39	386.15
Totals	267	120	32123		$6552.18	$5981.37



Showing construction of a 30 doz. egg case and proper method of packing eggs.

PRESERVING EGGS FOR WINTER USE

LATELY several articles and bulletins have appeared dealing with the preservation of eggs in water glass or lime water for use during the winter. However, the writers did not have occasion to mention that the months of July and August were less suitable for the preservation of eggs.

In the first place the fresh July or August eggs contain considerable numbers of bacteria, which of course will increase, and further the weather is very hot not only in the day time but also at night and the heat gradually penetrates even in the coolest of cellars. A temperature of 45°F. is the ideal temperature for the keeping of eggs, but even 55° or 60°F. is satisfactory. However, when the temperature rises above 60°F. the bacteria accumulate rather rapidly and eggs put up in July will be found to be quite stale in September, and much of the advantage of preserving is lost.

We therefore advise not putting up any eggs between July first and September first. In September the nights are much cooler, and so long that an even low temperature is maintained in the cellar. Of course in September eggs have advanced about 15 cts. a dozen, but this higher price is offset by the better quality of the eggs when kept 3 or 4 months.

Further, it has been found that when the weather turns warm water glass is a more reliable preservative than lime water and especially eggs mean to be consumed in the early spring should be put up in water glass, while the eggs for fall consumption can be put in lime water. Eggs preserved in the first week of October can be put in lime water and will keep perfectly until March.

J. VANDERLECK

PROVIDE SHADE FOR YOUR POULTRY

IF you have your poultry out in an open field or lot it is necessary that you provide them with shade. During the warm days the growing stock will thrive much better if they have shade provided for them.

Growing stock on the range.

Again, fowls intended for exhibition purposes should be kept out of the sun as much as possible, for the plumage will become sunburned and present a dead appearance. You can use old loose boards for this purpose. Make a light frame and cover with cloth, and nail on to four stout stakes about one foot high. Leave the four sides open.

S. A. BERGEY

Good healthy vigorous pullets that rest comfortably during the night.

OVERCROWDING THE GROWING STOCK

DURING the summer months many flocks of growing chicks suffer more or less severely from overcrowding. Very often fifty or more chicks are put into a house of a given size early in the spring. As the chicks mature and grow larger no more room is provided for them, in fact with chicks on the range this is too often forgotten. The colony houses are used only at night with the exception of bad weather conditions. These houses should provide not only a protection from weasels and other animals as well as a protection from bad weather conditions, but a clean, roomy, airy resting place for the birds. If they are forced to crowd against each other they will not only be hot and uncomfortable, but they will also be stunted and lowered in vitality. Among the factors that produce healthy vigorous stock one of the most important is roominess in the colony house. Avoid overcrowding which will result in stunting the growth and breaking down the general health of the birds.

S. A. BERGEY

GENERAL PURPOSE FOWLS FOR QUEBEC

THE Plymouth Rocks, Wyandottes, Rhode Island Reds and Orpingtons belong to the general-purpose type and will average about half way between the Brahma and Leghorn in size. The Orpington was originated in England, while the other three breeds of this type were originated in America. All breeds belonging to the general-purpose type have a combination of qualities which make them the most popular breeds of all. They possess egg-laying qualities to a marked degree, particularly where an egg-laying strain has been developed. Many egg-laying strains of the general-purpose breeds have been known to lay as well as a laying strain of Leghorns. At the same time, the fleshing qualities of these utility breeds compare favorably with those of the meat breeds. In size the three breeds do not differ very much. The Orpingtons are the heaviest, the Plymouth Rocks next, while the Rhode Island Reds and Wyandottes are approximately the same.

Poultry breeders say that "shape makes the breed", and the importance of this statement will be realized when the difference in the shape of the three breeds is clearly understood.

The Wyandotte has the deepest body of the three breeds and the Rhode Island Red has the least depth. The Wyandotte is short and deep, so much so, that if the head, tail and legs were removed

A pair of Light Brahmas owned by Macdonald College.

the body of the bird would be quite round. The body of the Rhode Island Red, on the other hand, would almost fit into an oblong, as the Red has a longer and straighter back than either of the other two breeds.

The shape of the Plymouth Rock comes in between the Wyandotte and the Red. There are other minor differences in form, but the shape difference is essentially distinct. Students of poultry culture should fix clearly in their minds the difference in shape of these three popular commercial fowls. The utility value of one breed may not be superior to that of another, but unless a particular bird is of the proper shape for that breed it cannot be called a well bred bird.

The more valuable varieties of Plymouth Rocks are the Barred, White and Columbian. New varieties are being added continually, but as yet they are not as popular as the older varieties. Among the many varieties of Wyandottes the White is the most popular. Other good varieties of this breed are: the Silver, Columbian and Partridge Wyandottes. Rhode Island Reds are divided into two sub-varieties: the Single Comb and the Rose Comb Reds. White and Buff Orpingtons are more popular than the Black.

The commercial qualities of these four important breeds should also be considered. The three American breeds have yellow colored flesh, yellow colored beak and legs, while the Orpingtons have white colored flesh, and the White and Buff Orpingtons have white colored beak and legs, while the Black Orpingtons have dark colored beak and legs. All four breeds lay brown shelled eggs of good size.

M. A. J.

MILK FOR CHICKENS

It has been maintained for a long time that milk is an excellent food for poultry, and to-day large quantities of sweet and sour milk are used. Where it has been given to growing chicks and to laying hens it has always been found that they do better than when milk is not given. The chief reason for the increased popularity in the use of milk lies in the fact that it serves to check the ravages of bacillary white diarrhoea. The liberal use of milk has had a wonderful influence in controlling this disease and so it may be said that milk has certain medicinal properties.

There have been numerous controversies over the relative value of sweet and sour milk. Some authorities claim that chicks cannot digest sweet milk while others claim that sweet milk gives equally as good results as sour milk. On this point the Connecticut Experiment Station has done some important experimental work, the results of which have just been published in Bulletin 80. The most important results from this experimental work relate to growth and mortality in chicks fed milk as compared with other chicks which were not given any milk. It was conclusively shown in all of the experiments that milk feeding stimulated growth and caused a great reduction in deaths from general causes. The chicks which received the milk were much larger than those which did not and they appeared to be stronger and more vigorous in every way.

A particular feature of the experiment was the results secured from feeding sweet milk as compared with sour. In all cases the feeding of sweet and of sour milk was followed by a marked increase in the weight of the chicks as compared with those which received no milk. Sweet milk compared with sour milk, however, gave practically the same results. This result was rather surprising in view of the fact that authorities on poultry digestion have claimed that little chicks cannot digest sweet milk. The Experiment Station at Storrs has proved that sweet milk is as good as sour milk for chick feeding but it points out that one or the other should be used constantly. It is not wise to commence feeding sweet milk and then change to sour or vice versa.

Some interesting conclusions were obtained in regard to mortality as influence by milk feeding. The chicks which did not receive milk has a much greater mortality than those chicks which received sweet or sour milk. Milk has the property of increasing vitality and indirectly of strengthening resistance to disease.

M. A. J.

WOMAN'S WORLD

FOODS AND FOOD PREPARATION

Lesson XVIII

Fall Fruits—The Apple

THE housekeeper welcomes heartily this season which brings an abundance of early apples as well as a great variety of vegetables. Most of the berry fruits have left us, but the ever-to-be-appreciated apple is the proud successor of them all.

The very name of "apple" is significant, for it originally denoted not one particular fruit, but fruit in general—any other than the apple being denoted by the addition of a suffix or a prefix, as in the Welsh, Aval-melynhir, a lemon, and the early English, Peche-apple, a peach.

The Apple in Canada. This king of fruits, the apple, is now grown over a large part of the Dominion. In Nova Scotia, Quebec and Ontario apple growing was undertaken first by the early French settlers and later by the United Empire Loyalists, who came to Canada soon after the treaty of 1783. Some of the first orchards planted were in the old Niagara district and in the Annapolis Valley. Ontario at present leads in the apple industry and Nova Scotia, Quebec, New Brunswick and British Columbia export also large quantities.

It is to be deplored that in many cases housekeepers have little definite knowledge concerning the apple in daily use. Every intelligent woman should know the Canadian apples by name and by sight, should know which provinces produce each variety, also which are early fall and which winter apples, as well as knowing the value of each in cooking, e.g., in jelly-making, for pies, for baking, for dessert, etc.

Dessert Apples. Ripe, raw apples, carefully selected and well washed make a refreshing and attractive dessert. The Quebec varieties best adapted for this purpose are the Fameuse, McIntosh Red and St. Lawrence.

Other available varieties. In the early fall we have the Peach apple, the Yellow Transparent, Liveland Raspberry, Nova Scotia Gravensteins and others. In this province we have few good winter apples, but the Spy, Bishop Pippin and Golden Russet are always in the market, as well as the other good keeping apples.

General Chemical Composition of the Apple:

Water	82.5
Carbohydrates	12.5
Ash	.4
Cellulose	2.7
Acids	1.0
Flavoring material	.5

The only nutritive element of any importance is the carbohydrate group, as is the case with fruits in general. The carbohydrate present is mostly fruit-sugar, but there is also cane sugar present. Pectin, the jellying principle in some fruits, is a carbohydrate also, and is found always in the apple. During the process of ripening some of this pectin is changed into pentose, a sugar, and for this reason apples for jelly-making should be slightly underripe. The amount of cellulose varies with different apples. It is always lessened by cultivation, as is evidenced by the difference between a crab and a Fameuse.

The mineral constituents of the apple are of considerable importance. They consist mainly of potash united with a vegetable acid, chiefly malic acid, which when burnt up in the body help to render the blood alkaline.

The Dietary Value of apples is very high. They are a very valuable source of cellulose and acids, and as each variety has its own flavor, apple dishes, though served frequently, need not become monotonous. Because they are not a nutritious food they are suitable as desserts in a heavy meal when cooked alone, or combined with flour mixtures, milk and eggs, they may be made a nutritious dessert, suitable for a meal which is not very heavy, e.g., apple batter pudding, apple pie, apple fritters.

The skin and core of the apple contains pectin and other valuable material, and for this reason jelly can be made from skins and cores alone. *Apple Sauce,* or stewed apples, should for this reason be made from the whole apple, cut in convenient pieces. When soft it should be pressed through a sieve, then sweetened and re-heated.

Apple Recipes.

Apple Pudding:

Prepare apples as for apple pie, sprinkle sugar between layers and a little nutmeg, or cinnamon if desired. Pour over this a cottage pudding mixture, using recipe given below:

Cottage, or Baked Batter Pudding:

¼ c. butter.
½ c. sugar.
1 egg.
½ c. milk.
1½ cups flour.
3 teasp. baking powder.
¼ teasp. salt.

Note: Be careful that the mixture is cooked where it joins the apples before removing it from the oven. The apples may be partially cooked before the batter is added.

Serve with lemon sauce.

Apple Pie:

3 cups flour.
1 c. shortening.
¾ teasp. salt.

Ice water sufficient to make a stiff dough.

Method: It is better to make pastry the day before it is to be used, or it may be kept on hand in the ice chest carefully wrapped in oiled paper. Cut shortening into the flour and salt, with two steel knives until mixture is granular. Then add ice water to make a stiff ball of dough, mixing with a knife.

For deep apple pie slice apple thinly in bottom of deep dish until dish is well-filled, sprinkling sugar between the layers and placing little dots of butter over the top. When dish is filled, roll the chilled paste out to ⅛ in. thickness, cut off a strip about ½ inch wide, then, rubbing rim of pie dish with water, place strip with cut edge out and fit to plate, being careful to overlap at the join. Then moisten this paste with water and place covering on pie loosely. With fork dipped in flour press down all around edges, being careful that no juice will have an opportunity to escape through rim of pie. Make a slit (two or three may be made) for the escape of steam, and bake in a hot oven until apple is very soft. Sprinkle with sugar and serve.

Apple pie with two crusts.

Place lower crust being careful that there is sufficient to hang over the edge all around. On this slice apples thinly, placing them close together and sprinkling sugar between the layers. Fill dish well, leaving a small space in the centre of the pie. Dot the surface over with pieces of butter, add a little nutmeg if desired and if apples are insipid, a few drops of lemon juice. Moisten rim of pie, place upper crust loosely, pressing the two pieces of paste tightly together with a fork dipped in flour. Make slits for steam to escape from pie. Chill it and bake in a hot oven until apples are soft. Sprinkle with sugar and serve hot or cold as desired.

Note: If deep apple pie dish is large a little support must be put in center of dish to prevent paste falling and becoming soggy.

Three cups of flour will make sufficient paste for two large, deep pies. From 2-3 to 1 cup sugar is required for a large pie. Use tart, juicy apples.

Apple Short Cake.

2 cups flour.
4 tblsp. butter.
4 teasp. baking powder.
2 tblsp. sugar.
1 egg.
¼ c. milk.
¼ teasp. salt.

Method: Sift together flour, sugar, baking powder and salt twice. Beat egg and add to it the milk. Cut in shortening with dry ingredients, and when granular make a well in centre and with knife make a soft dough, adding liquid gradually. Cook in hot oven on buttered layer cake tin. Splice while hot, using two forks, and at moment of serving add hot apple sauce between and on top. Serve with cream or top milk.

Apple Fritters:

Make a batter of the following:

⅓ c. milk.
3 tblsp. sugar.
1 egg.
1 c. flour.
¼ teasp. salt.
1½ teasp. baking powder.

Pare and core apples and cut in about ½-inch rings. Dip these in batter and fry in fat as doughnuts. Serve with lemon sauce.

Tapioca and apple:

Soak pearl topioca over night in cold water. Cook until transparent in double boiler. Sweeten to taste and add a few drops of vanilla and a little butter. Pour over apples thinly sliced in pudding dish and bake until apples are soft. Serve with cream.

Apple and Bread Pudding:

Into pudding dish place alternate layers of stale bread crumbs and sliced apples, sprinkling apples lightly with sugar. Having crumbs uppermost place dots of butter over the surface. A few drops of hot water may be added if desired and nutmeg or other spice may be used. Bake in hot oven until crumbs are golden. Serve with cream or top milk.

Crab-apple Pickles:

7 lbs. crabs (very firm).
3½ lbs. white sugar.
1pt. vinegar.

Stick 1 whole clove in each crab. Cook in vinegar and sugar syrup until tender, but not broken.

E. B. RUTTER,
School of Household Science

THE CHILDREN'S HOMER

II

The Adventures of Odysseus. 4

(Continued from last issue.)

"During the night we sailed, but not before we had called aloud the name of every comrade we had lost, that his soul might return to his own land. We were sad to go without our friends, but thankful that so many of us had escaped.

After that we sailed many days, sometimes delayed by adverse winds and sudden storms, but we came at last to the land of the lotos-eaters. I put in there for water, and sent three men to find out what kind of men dwelt in this place, of which I knew nothing.

"These men met the lotos-eaters, mild-eyed, melancholy folk, who bore the lotos branch, with flower and fruit, in their hands, and gave my men to eat. Having easten, they forgot me and their comrades and their homes, and only longed to rest there, and eat the lotos fruit for ever. I sought them when they did not return, but when I bade them come, they refused, and wept, and fougth against me; so I took them by force, and bound them, and laid them in the ship, commanding the others to set sail with haste, lest any more should taste the dreadful lotos-fruit.

"Our sea-faring brought us thence to the island of the Cyclops, the tall one-eyed giants who dwell in caves, each by himself. At the opening of the wide harbor there was a small island, where, in the dark of a cloudy night, we entered by chance the mouth of a small stream. There we anchored until dawn, and landing, found the place flocked with goats. We killed enough to make a great feast, for we had not had fresh food for many days.

"Next day I took council with my men, and arranged that they should wait while I, with a small company, went to the large island of the Cyclops, to see whether we should have a safe welcome there. At the island I chose my best twelve men, and, taking with me a flagon of rare wine and other gifts, led the way to the cave of the chief Cyclops. I had heard that they were rough and cruel monsters, unkind to strangers, and not to be trusted, but I thought that by my gifts I could win this Cyclops to better ways.

"When we came to his cave the Cyclops was not in sight. We wondered to see his big cheeses, and his cured meats, his goats' milk set to let the cream rise, all in order, and my men wished to seize the cheese and meat, and flee. I thought best not to do so, and toward evening he came, bearing a huge burden of firewood on his shoulders. He drove the goats to be milked into the cave before him, and then rolled a great stone, which not all of us together could have moved, before the opening of the cave.

He did not see us until he lighted his fire; then asked us fiercely who we were. I told him we were Greeks returning from the Trojan war, and begged him to receive us hospitably.

"He laughted and shouted, 'O, ye fools! But tell me quickly where is your ship, and are there other ships besides?' But I saw what he wanted, and told him our ship had been destroyed in a storm, and that there were no others. To that he said nothing, but killed two of my men right then and there, and ate them. Horror overcame us at a sight so dreadful, and we gave up all hope of life.

"But the giant had done enough for that time. He paid no more attention to us, and finally went to sleep. In the morning he killed two more men, and then went out to pasture his goats, closing the entrance to the cave quickly, with the great rock. While he was gone I set my wits to work, and thought out how we might escape.

"After a long day the Cyclops came back, and a third time killed two of my helpless friends. But I, not letting him see how I hated him, gave him some of the strong wine I had brought. It pleased him so much that he asked me my name, and promised me a favor. I told him Noman was my name. And then he laughed and said, "Well, good Noman, this great favor will I do thee, for this most excellent wine, I will eat the last of all thy men!

"But when he had at length fallen asleep, the more soundly for my rare wine, we took a great staff he had in the cave, and heated the end of it red-hot in his fire. Then we thrust it into his one great eye, and blinded him. Mad with pain and rage, he woke and called to his brother Cyclops for help, but when they came to the door of his cave, and asked him who had harmed him, he answered, 'Noman hath injured me.' Then they were angry, thinking he was playing a trick on them, and went away, without listening to his cries.

"He raged around, trying to find us, but he was blind and sick with pain, and it was easy for us to escape him. When morning came, he pushed away the stone just enough to let the goats out, one by one, and sat where he could feel each one as it passed. But I had thought of that, and had tied my comrades underneath the bodies of the biggest ones. I myself clung to the largest one of all, the favorite and pet of the Cyclops, but he never thought to feel *under* the goats, and so what were left of us escaped from that terrible cave and rushed to our ship and away from the shore.

"When we were a little way out, I shouted to the Cyclops, and told him how we had got out, and that my name was Odysseus. He came roaring and stumbling to the beach, and threw great rocks after us that nearly upset the ship. We heard him cry out that it had been foretold to him that he should lose his sight through Odysseus, and then we heard him pray to Poseidon, his father, to punish me, and never to let me cross the sea in safety. The great sea-god has surely heard and heeded that prayer of his blinded son, and his anger has pursued me on the seas all these long years."

MARGARET GRAY

THE FOUNDER OF MODERN NURSING

TO Florence Nightingale we owe our modern nurses. She was the first to suggest and carry out the means of making Nursing a profession for women.

Though English by race, Miss Nightingale was born in Italy on the 12th of May, 1820, and was named Florence from the city of her birth. She and her sister were the only children of rich parents who gave the greatest care to the education of their daughters. Florence took most kindly to her studies but the worth of her character lay in the combination of her gifts, in her humane and sympathetic heart as much as in her energy of will, and active brain.

Signs were early visible that the service of the sick was to be the lot of this younger daughter. In childhood she was never happier than when nursing the sick tenants on her fathers' place. She enjoyed the brilliant society to which she was introduced on growing up, but her ear and heart were ever open to the cry of human pain. At times she spoke timidly of certain independent schemes which were working in her brain. But to her parents they seemed wild and futile and they repeatedly sent her abroad in the hope that new scenes and interests might win her attention from these disturbing schemes. Their well-meant effort was to be of no avail. For it was on one of these trips that their daughter met the friend who was to give the greatest stimulus to all her hopes and aims, the philanthropist, Sidney Herbert, then travelling with his wife in Rome.

It was not till she had reached the age of thirty that Florence prevailed upon her father to allow her to attend the protestant sisterhood at Kaiserswerth, an institution recently established for the training of deaconesses for charitable work. The instruction she received while there was good for its opportunity. But it was far from being thorough, and once on her way towards the desire of her life—that of being useful to the sick and suffering poor—she determined not to let her project slip. A year's work followed in the hospitals of Paris under direction of the Sisters of Mercy. This accomplished, she returned to England, where she accepted a position as Superintendent of a London hospital. At this post she was busy, absorbed in eager plans for hospital reform, when the Crimean War broke out.

Her attention was called to the war by a letter in "The Times" stating that the wounded British soldiers were suffering from lack of care. Its effect upon Miss Nightingale was instantaneous. Within two days of its publication she had collected together a small band of nurses ready for the war, and had written to the Government to know if their services would be accepted. In the meantime her letter was crossed by one from the Minister of War asking her is she would undertake the guidance of such a party. It was not an easy undertaking. At the time, with the exception of the Roman Catholic Sisters and a few Anglican sisters of private institutions, trained nurses were unknown. A few women, it is true, were employed in the general hospitals of England, but only for the most menial duties, and they were women of a low and undesirable class. Miss Nightingale's practical mind made the best of the situation and so prompt was her action that within two weeks she was able to leave England with a well equipped staff of forty helpers, all of whom arrived at Scutari in November 1854, and remained there in all two years.

The story of their work in the Crimea is too well-known to need repetition here. It was no light task that awaited Miss Nightingale as Head of this experimental mission. That Britain should adopt women as military nurses was a startling innovation in itself and one that, naturally, at the first stirred up both medical and military prejudice. Florence Nightingale had many trials to face. She had work to do that tested her endurance and taxed her self-control and administrative powers to their utmost. In spite of the multitude of details that pressed upon her as Directress, she did her personal share of the nursing, often remaining for eight hours at a time upon her kness dressing the wounds of a fresh "load" just landed from the transport vessels. Her spirit proved unfailing, but the strain in time overtaxed her health and at the end of the year, during an attack of fever caught while nursing a patient in Balaclava, her life was despaired of for days.

From that moment she was Britain's idol. Touched to the heart, her country wished to show its appreciation of her by some public honour. When it was learned that she would accept nothing of a personal nature, a Fund was raised and placed to her credit for the furtherance of a Training School for Nurses, a project which it was known that she cherished. As soon as she was convalescent her friends implored her to return to England and so she was advised by her doctors. Her answer is best given in her own words. "For myself", she wrote simply, "I have done my duty. I am ready to stand out the war with any man". So she stood—remaining at her post even after peace was signed, looking after the departure of her nurses, and winding up the affairs of her mission.

If the eventful struggle of these years was at times a bitter one, at other times it brought her intimate rewards. The worship poured forth at her feet by the wounded soldiers to whom she came like an Angel of Mercy as they lay there within their walls of pain must have been an hourly stimulus. Daily, by her constant observation, she gained a new insight into the life of the ordinary British soldier. His delicacy of feeling in her presence touched her deeply. His patience during convalescence and his uncomplaining heroism in the face of awful death sank deep into her heart, developing there into a sympathy beyond words but which later she was able to express in the more helpful speech of lasting deeds.

The experience was one that determined her to devote her life in future to the achievement of two aims—to the bettering of the conditions of the British soldier, and to the founding of a Training School for women nurses.

The five years that followed her return from the East cover a wide accomplishment. Her health had never been robust, and it may have been a secret consciousness that her working days were likely to be short that spurred her efforts on. Whether this was so or no, during those five years both Sidney Herbert and Florence Nightingale bent all their powers to the improving of the conditions of the British soldiers and they achieved many practical reforms. They secured for the barracks better drainage, ventilation, heating, lighting, cooking, and also reading-rooms and soldiers' clubs as wholesome recreation. Further Miss Nightingale wrote (though for private circulation only) a comprehensive work on the health of the British Army in times of peace—a work which led to the forming of a Royal Commission to enquire into and report upon all health conditions connected with the Army. Two years later she succeeded in getting through a second Royal Commission to investigate and report upon the health of the British soldier in India. For none knew better than the Lady-in-Chief, as she was sometimes called in the Crimea, what the soldier was likely to suffer from the unsanitary conditions of the hot countries of the East.

When these reforms were safely launched she turned with equal energy to the second great object of her life, that of opening up a new profession to women by means of a Training School for Nurses. It was a grievous disappointment to her that her health would not permit her to accept the personal direction of this school. It had to be given over to an able deputy, yet throughout her remaining years Miss Nightingale kept up as keen an interest in both School and Nurses as if she had been their specially appointed inspector.

Happily this second work was included in the five years mentioned. For at the end of them there was to come a pause in Miss Nightingale's public efforts—a time in which she was to be set apart to do battle with a great personal grief—her grief at the death of her friend and fellow-worker, Sidney Herbert, who had now been made Lord Herbert by the Queen. He was a man of broad mind and high standards whose philanthropic aims had been identified with hers for fully thirteen years, and in her invalid state his loss was like the cutting off of her right arm in the matter of the reforms in which they were both so interested. But hers was too fine a nature to waste itself in grieving and at the end of the year she was back at her post, doubly earnest in carrying forward her benevolent schemes, regarding their competition now as in a measure a charge entrusted to her by her lost collaborator.

The associations of her old quarters near the Herberts had become painful to her through this great loss, and as she was fast becoming a confirmed invalid she decided to move into a new house of her own in London near that of her married sister. The windows of her bedroom and of the sitting-room adjoining it overlooked the Park; and they were large, cheery windows fitted up with balconies for flowers. Fireplaces added further brightness to these rooms which were always sweet with the cut flowers sent by friends. Nurse-like she clung to white walls and would have neither blinds nor curtains. Her furniture was in keeping, plain and even cheap, yet her surroundings were exquisitely fresh and dainty.

In this corner of light and bloom there was to be no invalid repining. If Florence Nightingale was frail in body she was staunch in spirit. In this sunny workshop which she had fashioned for herself she turned afresh to her labours. Here she planned out her sanitary schemes for India. Here her hospital problems were decided. Here nurses, relatives, intimate friends, army officials, indeed almost all the great men of the day, prime ministers, Governors of India, heroes like Chinese Gordon and Garibaldi, and even Royalty came and went at times, feeling privileged to do so, and few leaving those rooms unimpressed by the wit and charm of their invalid occupant. Yet all was so quietly managed that even the world that so admired her often forgot that Florence Nightingale was living in its midst.

So diffused was her influence it is hard to follow its many outflowings. What it meant in encouragement to her Nurses in their acceptance of ever-widening duties; what it meant in sympathy for Nurse Agnes Jones who gave her life in her exhausting struggle for reform of the Workhouse Infirmaries of Liverpool; what stimulus it gave to the volunteer nurses who went out to the wars of Egypt and South Africa; and with what fresh faith and hope it watered the hearts of those engaged in rescue work in the slums of London! Her advice was constantly being asked for on all matters connected with nursing; her influence powerful in forming the National Society for Aid to the Sick which has now become the Red Cross Branch of Britain. And all this necessitated not only much physical fatigue but many hours of aching thought.

Yet her invalid condition was not allowed to interfere with her hospitality. Apart from her personal quarters, her house was furnished for the comfort of her guests with taste and richness. As a housekeeper she was unexcelled. Her directions written down for her servants were practical, sometimes severe, often softened by her sense of humour as when on one occasion she wrote to the cook regarding certain unsatisfactory cutlets, "Now, why was the glue pot used?" The Crown Princess pronounced her luncheons at Miss Nightingale's house as being "works of art".

It is comforting to feel that the success of her Training School must have gladdened her later years, more inspiring still to realise how she must have rejoiced at the improved methods of training which were gradually developed; at the evolution of District Nursing, and at the starting of kindred training schools for nurses in Canada, Ceylon, India, Sweden, Germany, the United States, and even in Japan, and the frequency with which her "Nightingale Nurses" were chosen to superintend these distant schools. Her unselfish efforts doubtless kept her young; for even at the age of seventy-seven, when her father, mother, and sister had all been taken by death, she describes herself in a letter to an old friend as still living "soaked in work".

The dawn of the twentieth ventury marked her eightieth year and it was an anniversary broadly remembered. Congratulations were showered upon her even from the Mayor of her native city of Florence, as from Britain and the Overseas Dominions, the United States and Japan. But best of all to her were the messages sent her by the veterans of the Crimea, recalling the stirring times in which they "had served with her" and their grateful remembrance of her loving kindness. All that public testimony could do as an appreciation of her great and noble work was done. But the shadows were fast lengthening and life's evening time was drawing near. Shortly before her death King Edward conferred upon her the Order of Merit, which was then for the first time bestowed upon a woman, and on that occasion she received from Lord Roberts, the Head of the British Army, a most gracious and sympathetic message.

At the beginning of August of the year 1910 she was slightly ailing, though no alarm was felt. But on the thirteenth of that month she fell asleep at noon and from that peaceful slumber never woke again. She had lived out just ninety years. In keeping with her written desire her funeral was very plain in circumstance, her only memorial being, as she had wished it to be, that of a small cross carved on one side of the family monument with her initials and the dates of her birth and death inscribed beneath it.

In one of her note-books later the following lines were found written in her own clear characters:

"Life is no holiday game, nor clever book, nor school of instruction, nor valley of tears. But a hard fight, a struggle, a wrestling with the principle of evil, hand to hand and foot to foot. Every inch of the way must be disputed".

It was with understanding then as well as with a fire that never failed to thrill her listening attendants, that Florence Nightingale as the shadows gathered closer so often repeated the lines of her favourite hymn.

"The Son of God goes forth to war
A kingly crown to gain.
His blood-red banner streams afar,
Who follows in his train?"

SYLVIA.

ALFALFA FOR DAIRY PROFITS

THE following is the prize winning essay at New York State Fair on the subject of alfalfa. It was written by J. K. Wilson of Geneva, N. Y.:

The subject of growing and feeding alfalfa for dairy profit naturally divides itself into two parts. The first, growing of alfalfa, is beset with many difficulties.

The greatest one is to get the crop established. Several factors may be concerned in this. Among these poor seed, poor fitting of the seed bed, sour soil, wet soil, sowing with a nurse crop, lack of nodule bacteria, lack of humus, weeds, disease, close cutting and winter injury are chief. If the first winter is passed safely the chance of ultimate success is excellent.

In view of the above difficulties in growing alfalfa one might confine his first efforts to a single acre, managing that acre, if possible, so as to determine what line of treatment, if any, his land needs in order to grow alfalfa. After this has been found out, it can be met on any number of acres.

Choose what you would call a good piece of land. One which will grow red clover is a good choice. Sandy or gravelly loam is best, for alfalfa is a deep feeder, sending down a central tap root into the soil where no other plant has fed. Land which is not well drained should be avoided. In any case, the land should be well fitted. It should be disked, rolled and harrowed until it is in fine garden condition. This important matter is too frequently neglected.

After this has been done, divide the field into as many parts as there are factors which you would like to know have an influence on the growing of alfalfa, and leave one part of the field untouched, so that you can tell what effect the various treatments have upon the crop. Apply each material to its apportioned part of the field. If you are testing out the value of inoculating soil it should be applied just before the seed is covered. The whole field should be so cultivated alike two or three times at intervals of seven to ten days in order to destroy the weeds. According to a recent bulletin from the state experiment station lime and inoculation are two very important factors to be tested out on each farm, not only in separate parts, but also in combination.

Purchase about 25 pounds of seed for one acre. Be sure to get good seed, for many have failed to grow alfalfa because they sowed poor seed. Some samples were found upon analysis to contain narrow leafed plantain, yellow and green foxtail, trefoil, wild carrot, dodder and thistle. Sow this without a nurse crop any time between May 20th and August 30th when the land is in proper condition. The following year, if not the same one, there ought to be a good cutting on one or more parts of the field. After this cutting has told you what treatment your land needs in order to grow alfalfa meet that demand on the desired acreage, and you are ready to grow alfalfa for profit.

While there are many ways of feeding alfalfa profitably, there is one way which seems to be exceptionally remunerative and quite economical for several reasons. Early in the spring, when the alfalfa is about twenty to twenty-four inches high, begin soiling the dairy herd. By this method, one ought to have the best of green feed for his animals in about 125 days. If the acreage of the field is in proportion to the herd, it will be about cut for the first time when the second cutting is ready to begin on. If there is more alfalfa, however, than can be fed green, make hay of it and substitute it for part of the grain later.

Soiling is much more economical than feeding the dry hay. Men experienced in handling alfalfa figure that about 20% of the value is lost by the curing and putting it into the hay mow. This loss is due to improper handling causing the leaves to fall off. Soiling also furnishes a ready market for the alfalfa. If cows are fed ordinarily the following ration of four pounds of wheat bran, two pounds of distillers grain, one and one-half pounds of cottonseed meal, and are changed to sixty pounds of green alfalfa and one-half the above grain ration, they will give the same results in the milk pail and probably gain in flesh.

Again, assuming that alfalfa, cornmeal, cottonseed meal and wheat bran cost $20 a ton each and fed to cows of 1,000 pounds, giving twenty pounds of milk daily, as follows: Cornmeal, three pounds; cottonseed meal, one pound; wheat bran or dry alfalfa, four pounds, the alfalfa rations ought to produce 100 pounds of milk for 44 cents and the bran ration for 46 cents. But as the bran costs $28 a ton and the alfalfa hay only $16 it cheapens the cost of the production on the alfalfa ration and increases it on the bran.

While the system of soiling has some disadvantages, its advantages are given as follows: Permits a more intensive system of dairying and keeping a larger number of cows; permits the production of milk free from flavors due to garlic and other weeds; furnishes a succulent ration and maintains a continuous milk supply when pastures may be seriously affected by drought; decreases the necessity of a heavy grain ration and the purchase of concentrated feeds.

HYDRATED LIME

(From Dr. Hopkins' "Story of the Soil.")

"CAN you tell me anything about this hydrated lime?" "I can tell you it is correctly named" Percy replied:

"*Hydrated*" means *watered*, and as an investment it is properly classed with other watered investments. If you prefer to use hydrated lime I would suggest that you buy fresh burned lump lime and do the hydrating yourself, which only requires that you add eighteen pounds of water to each fifty-six pounds of quick lime. In other words, that you slack the lime by adding water to it. Both quick lime and hydrated lime are known as caustic lime. Webster says that the word caustic means capable of destroying the texture of anything or eating away its substance.

"This definition is correct for caustic lime as you can easily determine by keeping your hand in a bucket of slacked lime a few minutes. In an experiment conducted by the Pennsylvania Experiment Station, during a period of sixteen years, eight tons of hydrated lime destroyed organic matter equivalent to thirty-seven tons of farm manure, as compared with equivalent applications of ground limestone; and, as an average of the sixteen years, every ton of caustic lime liberated seven dollars worth of organic nitrogen as compared with ground limestone. That this much liberated nitrogen was essentially wasted and lost is evidenced by the fact that larger crops were produced where ground limestone was used than where burned lime was applied."

Just a word more. We have seen hundreds of farmers applying quick or caustic lime to their land. Would they have done it if they had read of the above experiment? Does not this show that as farmers we cannot afford to be ignorant of what science teaches in this and many other particulars?

SCIENTIFIC PUZZLES

EVERYONE knows that the diamond is only charcoal crystallized; but there are a great many other things in nature that, though possessing widely different properties, are composed of exactly equal quantities of the same elements.

The white of an egg and rattlesnake poison are formed of identically the same amounts of the same elements.

The oil of roses and common coal gas are each formed alike, both being composed of four atoms of hydrogen and four atoms of carbon.

All the hydrocarbons, known to science as a combination of sixteen atoms of hydrogen and ten atoms of carbon, are alike in their composition.

The suggested explanation of these peculiarities is that the atoms are placed differently towards one another in the molecules of the different substances.

Other things just as peculiar are evident when certain substances are united chemically. Thus hydrogen gas, which is odorless, and nitrogen gas, which is also odorless, when united go to make ammonia, which has a very strong odor. Copper, which has no odor, and zinc, which has also none, when melted and mixed give us brass,—a substance with a characteristic one.—*Glasgow Herald.*

A San Francisco clergyman recently at the close of his sermon announced that in the course of the week he expected to go on a mission to the heathen. One of the parishioners exclaimed: "Why, my dear doctor, you have never told us one word of this before. It leaves us unprepared. What shall we do?" "Brother," said the minister solemnly, "I shall not leave town."—*Argonaut.*

The Westminster Gazette tells of a tourist doing the sights of Edinburgh who, on being informed by his guide that he was in John Knox's house, put the question, "Who was John Knox?" In a scandalized tone he got the reply, "Man, d'ye never read yer Bible?"

Tom, the country six-year-old, presenting himself one day in even more than his usual state of dust and disorder, was asked by his mother if he would not like to be a little city boy, and always be nice and clean in white suits and shoes and stockings. Tom answered scornfully, "They're not children; they're pets."—*Harper's Monthly.*

OF GENERAL INTEREST

FOR CHEAPER MILK

Duplication of Effort in Delivery an Economic Waste—Producer, Distributor, and Consumer Suffer

MILK-WAGON routes in large cities retrace and "crisscross" one another, thus adding to the cost of distribution. This duplication of effort has a direct bearing on the retail price of milk, as it increases the expenses of the milk dealers. On the other hand, it is also a tax upon the farmer, for it tends to keep down the price paid for milk on the farm. It must be understood, however, that much of the waste in milk delivery under the present system can not be entirely prevented, because there are so many dealers in each locality and competition is keen. According to the dairy experts of the department, efforts should be made, nevertheless, by the dealers to concentrate their business as much as possible, so as to lessen the distance traveled by the wagon for each quart of milk delivered, by securing a large number of customers in a small area.

The accompanying table presents in concrete form the data which are now being prepared by the department on the distribution of milk in some of the large cities. In the District of Columbia 98 routes were measured. The shortest distance traveled by any wagon was 10.4 miles and the longest was 30, showing a considerable variation. The average distance for the 98 wagons was 19.1 miles. When these measurements were made there were approximately 510 miles of streets in the District and 250 wagons were making the retail deliveries of milk. Figuring that each of these wagons traveled 19.1 miles, they all covered 4,775 miles each day, or 9.3 times the sum of all the streets in the District. Thus the time of about 8 of every 9 wagons was used uneconomically. More than 80 dealers were making the deliveries.

The table following represents a study of a few wagons in each city and does not indicate the total number of wagons or the total amount of milk handled in each city.

MILK ROUTE SURVEY OF FOUR CITIES.

City.	Number of wagons.	Number of dealers.	Average miles traveled.	Varying from—	Average load per wagon.	Varying from—	Average number of quarts delivered per mile.	Varying from—
					Quarts.	Quarts.		Quarts.
Pittsburg.	41	1	14.2	5.5 to 30.7	327	183 to 448	23.07	8.7 to 59.3
District of Columbia . .	63	14	18.6	10.4 to 30.0	3,018	140 to 648	16.2	6.8 to 44.0
Baltimore	11	1	20.2	9.9 to 30.5	215	112 to 316	16.15	3.9 to 22.2
[illegible]	22	1	20.35	7.7 to 43.6	245	180 to 290	12.03	4.1 to 35.8

Weekly News Letter

The present trend in retail business seems to be toward the small package. A few years ago many kinds of food were sold in bulk which at present are purchased, to a large extent, in small packages. The same trend is noticeable in the retail milk business, there being a greater demand for pint bottles than for quart in the five large cities recently studied by the department—Boston, Washington, Pittsburg, Philadelphia, and Baltimore. Seventy-four dealers in these cities handled daily about 260,000 quart bottles and 361,000 pint bottles. About 41 per cent of the total bottled milk of these dealers is handled in pints.

It takes considerably longer to wash and fill two pint bottles than one quart; moreover, it costs nearly as much to deliver a pint as it does a quart bottle of milk. One dealer, who handles quarts only, says it would take the profit from 1 quart of milk to make up for the loss on 1 pint, yet, as the figures show, there is a surprisingly large number of pints handled by some dealers.

Where Do the Bottles Go?

The loss of bottles is a perplexing problem to all dealers and, in the aggregate, the total amount of money lost reaches great proportion in a year. The life of a pint bottle is much shorter than that of a quart, which is computed to last from 6 to 50 trips, the average being 22.5 trips. If the dealer delivers 10,000 bottles daily, and they cost him 3½ cents each, his daily expense for replacing bottles would be $15.55, or $5,675.75 a year. It is necessary to use small bottles for some kinds of trade, as, for instance, the hotel or restaurant trade, where the guests are served milk in the bottle, but the cost of delivery and the loss of bottles in connection with this trade is usually small. In some sections of the cities customers often feel unable to buy more than a pint of milk at a time; this has a tendency to cut down the consumption of milk. Other families are so small that they require no more than a pint.

If a pint sells for more than half the price of a quart, as is often the case, then buying by the pint is the more expensive method for the consumer, as he pays the extra cost of delivery. If there is no difference in price, then the extra cost of delivery comes out of the profits of the dealer. The small local community stores often handle large quantities of milk, and here, too, the greatest demand is for pint bottles.

On account of the convenient size there is also more temptation for the customers to appreciate a pint bottle instead of the quart for the preserving of vegetables and fruits, and for other purposes. Although in most places this is contrary to law, yet it is often done without any feeling of guilt on the part of the housewife. Not all bottles, however, are lost or broken, large numbers being simply mislaid. Some get into the hands of other dealers, some are dumped into the ash barrel by persons ignorant of their value, while others are lost.

In some instances milk-bottle exchanges have been established; these are either owned and operated by the milk dealers or by an independent company. Establishments of the different dealers are visited regularly, and all stray bottles brought to the exchange headquarters, where they are washed, sterilized, and assorted. The price paid by the dealer to the exchange varies from one-fourth to one-half cent. The object is simply to aid the dealers in recovering their bottles, and they can well afford to pay the small price asked by the exchange for this service. It does not, however, do away altogether with the large loss of bottles incident to the milk business. Junk dealers and employees on city garbage and refuse dumps very often return large numbers of bottles to the milkmen; in fact, in one city the milk-bottle exchange recovered, in three years, about 1,500,000 bottles from the refuse dumps.

Keep the Milk Cold

The city consumer of milk can greatly aid the dealer by cleaning and returning promptly every bottle received. The bottle should be washed in clear, warm water, then in very hot water, and stood wrong side up in a clean place to dry. This, done by the housewife, is particularly a saving when the dealer or dairyman operates only a small plant and does not have the outfit for rapid cleaning. Milk left in bottles to get sour or to putrefy adds to the dairyman's cost for cleaning them, and the same is true when a little milk is allowed to dry in the bottle, especially in the angle around the bottom.

Another way in which the consumer can cooperate is by quickly removing the milk from the doorstep or porch where the heat from the sun is likely soon to affect it. The farmer and the dealer, if they have done their part in keeping the milk cold, can not be held responsible if the consumer fails, immediately upon receipt of the milk, to put it into the refrigerator. A few hours' exposure to the summer heat soon brings the temperature up to above 50° F., where the bacterial content increases rapidly. The department's experts advise keeping the milk, as much as it is practicable, in the original receptacle in which it is received, and at a temperature of between 40° and 50° F., thus aiding in keeping down the great summer waste caused by the souring of milk.

Weekly News Letter,
U. S. Dept. Agr.

VALUE OF LIQUID MANURE

Great Waste Results from Loss of the Most Valuable Portion of the Manure

ONE of the most serious sources of loss of farm manure is the practice of allowing the liquid portion to drain away and be lost. On many farms there are stables with cracks in the floors through which the liquid escapes, and even today some farmers are guilty of boring holes in the floor to get rid of the urine from the farm animals. By so doing they are facilitating the loss of the most valuable and quickly available fertilizing portion of the manure.

While the analyses by various investigators do not exactly agree regarding the relative amounts of fertilizing constituents contained in the solids and liquids, all agree that the fertilizing elements contained in the urine of farm livestock is much greater than that in the solid dung. The serious nature of the loss which the farmer must suffer when he allows any portion of the urine of his domestic animals to be lost, or permits the natural drainage from the manure to escape, will be made very apparent by examination of the figures in the table here given showing the composition of these different classes of material. These figures are taken from an article by W. P. Brooks in Cyclopedia of American Agriculture by Bailey:—

COMPOSITION OF FRESH EXCREMENT

One thousand pounds of fresh dung contain:

	Water Pounds	Nitrogen Pounds	Phosphoric Acid Pounds	Alkalies Pounds
Horse . .	760	5.0	3.5	3.0
Cow . . .	840	3.0	2.5	1.0
Swine. . .	800	6.0	4.5	5.0
Sheep . .	580	7.5	6.0	3.0

One thousand pounds of fresh urine contain:

	Water Pounds	Nitrogen Pounds	Phosphoric Acid Pounds	Alkalies Pounds
Horse . .	890	12.0	0.0	15.0
Cow . . .	920	8.0	0.0	14.0
Swine . .	975	3.0	1.25	2.0
Sheep . .	865	14.0	0.5	20.0

COMPOSITION OF DRAINAGE LIQUORS

One thousand pounds contain:

	Water Pounds	Nitrogen Pounds	Phosphoric Acid Pounds	Alkalies Pounds
Drainage from gutter behind milch cows.	932	9.8	2.4	8.8
Drainage from manure heap	820	15.0	1.0	49.0

Under average conditions the weight of urine from the cow will be about double that of the solid dung. With horses and sheep the solid and liquid are about equal, while, with hogs, the amount of urine varies much according to the feed but is usually very abundant. Applying these facts to the above table, it will be seen that the nitrogen in the total urine of the cow would amount to over five times the nitrogen in the total solid dung, while, with horses and sheep, there would be about double the amount of nitrogen in the urine as in the solids. There is also much more potash contained in the urine of these animals than in the solids as is shown in the table.

Since nitrogen and potash are both expensive if the farmer has to buy them, it would be wise and profitable for every farmer to prevent their loss through the escape of the liquid manure. Straw is a good absorbent but if the crop is short, leaves, sawdust or air-dried muck may be used to advantage.—F.C.N. in *Conservation.*

THE ORIGIN OF THE TOMATO

EXCEPTING our scientists, there are comparatively few people in this country who ever stop to think of how many important products that now minister to the health, sustenance, and pleasures of mankind were added to the world's supply by the discovery of America. A few of these are incidentally mentioned in an interesting article on "The Tomato", in the current number of *The Bulletin of the Pan American Union*, by Edward Albes, who writes:

"The greatest febrifuge known today—quinine — came into existence because the Incas of Peru had discovered the medicinal properties of the bark of the Cinchona tree; the leaves of the coca plant, a South American product, have served to alleviate pain the world over by their essence — cocaine; Indian corn, or maize, was unknown to the Old World before it was found to be the great food staple of the Americas; Irish as well as sweet potatoes had their first home in the New World; the delicious concoction known as chocolate, serving man as both food and drink, had been known for centuries by the Incas of Peru and the Aztecs of Mexico before the Spaniards found it in these countries and introduced it into Europe; tobacco, whose rings of aromatic smoke now circumscribe the earth, was added to man's pleasures by the Indians of America. Many other products might be enumerated, but among them all perhaps none ministers more delightfully to the palate of the modern epicure than does the tomato, that lucious, succulent, refreshing vegetable-fruit which gratifies the eye with its beauty of color and form, stills hunger with its meat, and assuages thirst with its juice."

The name "tomato" seems to be of Aztec origin, given as *tomatl* by some authorities and as *xitomate* by others, and still persists in some few of the older Mexican town names, such as Tomatlan, Tomatepec, etc., but the general consensus of opinion among botanists seems to be that the plant and its culture for edible purposes originated in Peru, whence it spread to other sections of the Americas. It is certain, at any rate, that it was known and cultivated for its fruit centuries before the Columbian discovery.

That the cultivated tomato was known to some of the European botanists over 360 years ago is evidenced by the fact that two large varieties were described by Matthiolus as early as 1554, but for many years it was only in southern Europe that the value of the fruit for use in soups and as a salad was recognized. It was quite generally used in Spain and Italy during the 17th century, but in England and in northern Europe generally the plant was grown only in botanical gardens as a curiosity and for ornamental purposes. It was seldom eaten, being commonly regarded as unhealthy and even poisonous. This belief probably arose because of the close resemblance of the plant to its allied relative the nightshade, or belladonna, and had, of course, no foundation in fact. It was not until the early part of the 19th century that the tomato came into general use as a food in northern Europe and even in the United States. Since about 1835, however, the use and cultivation of the vegetable has grown to such an extent that it has now become one of the most important of our garden crops.

When a successful process of canning the fruit was evolved the tomato industry at once assumed large proportions. It was found that for all cooking purposes the canned fruit was as good as that fresh from the vine, and as a result the tomato has become a staple food the year round, and millions of dollars are now invested in canning factories in the United States, whose chief output consists of tomatoes. From statistics compiled by the National Canners' Association for the year 1914 it is learned that among the tomato-producing states Maryland ranked first with a production of 5,850,000 cases of canned tomatoes; Delaware second, with 1,335,000 cases; Indiana third with 1,295,000 cases. The total production for the whole country amounted to 15,222,000 cases of tomatoes and about 5,000,000 cases of tomato pulp (used in making catsup, sauces, soups, etc.) The total was therefore over 20,000,000 cases of 24 two-pound cans each, or an output of 480,000,000 cans, weighing 480,000 tons, and having an approximate value of $28,000,000. If these cans were placed one on top of the other the resulting column would be very nearly 37,000 miles high, or if placed end to end in a row would encircle the earth one and a half times at the equator. These figures deal only with the canned product of factories keeping accurate statistics. When we remember that perhaps twice as many more are eaten raw and canned by the thrifty housewives and Girls' Canning Clubs, we may get some idea of the importance in our national economy of the garden tomato.

THE NEED OF STATISTICAL INVESTIGATIONS

By Prof. G. F. Warren, Cornell University

ONE of the most firmly established traits of human nature is to notice striking exceptions and make rules from them. The normal, or usual thing, is too common to be noticed. It is said that unlike persons attract each other. Statistical measurements of husbands and wives indicate that the opposite is the rule. The normal condition is so common as to attract little attention. The exceptions are conspicuous, attract attention, and result in exactly the wrong conclusion.

Nearly every one believes that if there is a warm fall, we shall have to "pay for it" by having bad weather in winter. Statistical records indicate that there is no such relationship. Whatever the fall, we should expect the normal winter and be prepared for the variations from that normal that the records indicate may occur.

When a noted veterinarian was called across a continent to see whether the fumes from a smelter were hurting range horses, he did not spend much time on the sick horses. He first went to a similar valley sixty miles away and killed a number of horses in order to study the normal. He found the same condition that was attributed to injury from fumes. He first determined the normal. Needless to say, his testimony won the case.

If one does not know the normal, and the usual variations from that normal, he is more likely to attribute the success or the failure of a farm to the wrong than to the right cause. Not infrequently the very worst point in the system is picked out as the cause of success, just because that point is striking.

Mere travel through a country, visiting on farms, or speaking to farmers in a region is likely to result in memory of the striking or the unsual. It in no way takes the place of statistical study. The very assurance that comes from observation sometimes makes persons with such experience the last to believe the truth of statistical studies, just as the practical breeder who sees "instances" is sometimes the last to believe the result of statistical studies of inheritance. Survey methods disprove many popular notions about farming, just as biometrical methods disprove old superstitions about heredity.

Some facts can be determined only by studying farms.—There are many kinds of agricultural information that can be determined only by survey methods, because the facts exist on the farms and nowhere else. The cost of producing a crop may be determined for a college farm, but this tells very little about the cost on regular farms.

The relative amount of food fed to a cow and a sheep by farmers can be determined only by studies on farms. One scientist stated that the results given for Tompkins County, New York, were wrong because they did not agree with some results from a German experiment station. Investigations at experiment stations cannot determine what the farmers feed. The only possible place to study this question is on the farms.

What is the usual farm practice in feeding cows in a dairy section? Not the practice of some few farmers that the college person happens to know, but the practice of the majority and the variations from this practice by individuals.

In nearly all cases public workers see much more of the farmers who are following methods recommended than of the normal farmer. The resulting idea of farm conditions is far from correct.

In statistical investigations results are not based on opinions, but on figures. We do not ask farmers what they think about tilling orchards. We learn the tillage practice and the yields, and find the results. Farmers are likely to draw conclusions from exceptional cases, just as are all other persons. Statistics are very much better than opinions.

ELIMINATE THE FLY

Powdered Hellebore a Simple and Effective Means of Destroying the Dangerous Pest in its Favorite Breeding Place

AN educational crusade against the house fly in which every proper means of publicity should be employed is urged by the Department of Agriculture. In a new Farmers' Bulletin, No. 679, it is stated that the danger from the house fly must be brought more forcibly home to the people before health officers can do effective work. By the expenditure of sufficient pains, any one individual may prevent flies breeding on his premises, but this will not rid him of the danger from flies if his neighbors are careless.

There is, however, no excuse at the present time for permitting flies to breed in anything like the numbers in which they have done in the past. The vast majority of flies develop from eggs which are laid in horse manure, and there are two simple ways of destroying the larvae, as the young insects or maggots which hatch from the eggs are called. Sprinkling the manure heap with a solution prepared by adding one-half pound of powdered hellebore to 10 gallons of water will destroy, according to recent experiments, from 88 to 99 per cent of the larvae in the manure. If this is not done, the use of a simple maggot trap will prove equally effective. By experiments carried on by the Bureau of Entomology of the United States Department of Agriculture at the Maryland Agricultural College, it was found that the trap used there destroyed fully 99 per cent of all the maggots or larvae breeding in a given lot of manure.

The Maggot Trap

Such a trap is simplicity itself, consisting merely of a slatted platform standing about 1 foot high upon a concrete floor which is surrounded by a rim or wall of concrete 4 inches high. The floor slopes a little toward one corner in order to allow liquid from the manure to be drained off into a small cistern. Ordinarily, however, this drain is plugged with a stopper and the concrete floor filled with water to a depth of 1 inch in the shallowest part. Each morning the manure is removed from the stable and heaped upon the platform. The flies lay their eggs on it as usual, and the larvae hatch as usual. The larvae, however, when about to enter the pupal or resting stage, preliminary to emerging as adult flies, invariably endeavor to migrate, crawling about in search of a suitably dry spot in which to enter into pupation. In the maggot trap, therefore, as soon as the larvae attempt to leave the manure on which they have been feeding, they fall through the openings in the slatted platform into the water below and are drowned. Each week the drain should be opened and the dead maggots washed from the floor of the trap into the cistern near by. A platform 10 by 20 feet in size will hold the manure from 4 horses during a period of four months, or from 25 horses for about 20 days. The slats should be 1-inch strips with one-half to one inch spaces between them.

Experience with maggot traps has brought out the fact that these are most effective when the manure is kept compactly heaped and well moistened. This is due to the larvae's desire to find a comparatively dry place in which to pupate and, consequently, they crawl away from wet manure. Wherever possible, therefore, it is advantageous to preserve all the liquid manure both in order to moisten the pile and because of its own fertilizing value. In the second place, the platform should stand not less than 1 foot above the concrete floor in order that the floor may be more easily cleaned. A third point is that old manure does not attract flies for breeding. A lot of manure need remain on the maggot trap but 10 days in order to prevent any breeding taking place in it.

The maggot trap thus presents the great advantages of being easily constructed and cheap. That it is effective, the experiments at the Maryland Agricultural College have conclusively shown. There it was found that it destroyed 99 per cent of the larvae breeding in the manure and that the number of flies around the college kitchen was reduced by between 67 and 76 per cent. That the reduction in the number of flies was not equal to the percentage of larvae destroyed was due to the fact that there were other piles of untreated manure elsewhere in the vicinity and that flies bred in these. Such traps may be built in almost any size, and they appear to be especially well adapted for controlling the pest under ordinary country conditions.

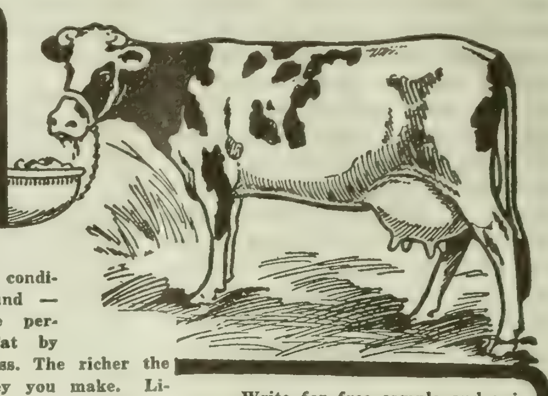
In cities and towns it is probable that the treatment of manure with hellebore will usually be found more advantageous. Ten gallons of the solution already described, composed of one-half pound of powdered hellebore to 10 gallons of water and allowed to stand 24 hours, will be sufficient for the treatment of 8 bushels, or 10 cubic feet, of manure. A weaker solution than this is not so effective. The hellebore does not alter the composition of the manure in any way and does not cause any injury to crops on which the latter is placed. In fact, the only possible way in which it can do any injury upon the farm is in case the barrel or tank in which the solution is stored is left uncovered in a place where some of the farm animals may drink from it. The most ordinary care, however, is sufficient to prevent such an accident. The cost of the treatment, with hellebore selling from 12 to 16 cents a pound and in large lots for 10 cents or less, is estimated at a little over 1 cent for every 2 bushels of manure.

Borax is perhaps even more effective in the killing of larvae than hellebore, but borax has the disadvantage of exerting, in large quantities, an injurious effect upon plants. It is possible that manure treated with sufficient borax to destroy the larvae and then applied to plants at a greater rate than 15 tons per acre may work harm to certain crops. Where borax is used for the prevention of flies, therefore, no more than 1 pound should be employed for every 16 cubic feet of manure, and this manure should not be used at a greater rate than 15 tons to the acre.

This objection to borax, of course, does not apply to its use on the ground of stables with soil floors, in privies and refuse piles, and on other accumulations of decaying material in which flies may lay their eggs.

The Fly a Carrier of Disease Germs

While the use of maggot traps and the treatment of manure with hellebore or borax are most effective in reducing the number of flies, it is not likely that they will actually exterminate the pests in any neighborhood. The precaution of screening windows and doors and in particular the protecting of all articles of food with fly-proof screens is, therefore, urgently recommended by the Department of Agriculture. Screening, of course, has no effect upon the number of flies, but it does minimize the danger of infection. Comparatively few people realize how admirably adapted from its structure and habits the fly is to carry disease. The body of the house fly, and especially the legs, are thickly covered with hairs and bristles. As the fly crawls about over the decaying organic matter on which it likes to feed, these hairs readily pick up disease germs and carry them to the human foods which the fly subsequently visits. The fly is continually passing from piles of refuse and filth to kitchens and dining rooms, and in each one of these journeys it can with the greatest ease bring with it the germs of any intestinal disease. Typhoid, Asiatic cholera, dysentery, and infantile diarrhea are among the diseases which are known to be transmitted in this way, and there is very strong evidence that tuberculosis, anthrax, ophthalmia, smallpox, and other diseases are carried through the same medium. It has also been demonstrated that not only are disease germs carried in this mechanical way upon the legs and body of the fly, but that these germs flourish abundantly



This Feed Costs Nothing

If you count the results it gives.

Livingston's Oil Cake is just what cows need.

It tastes good—is easily digested — keeps stock in prime condition all the year round — actually increases the percentage of Butter Fat by 16% over Pasture Grass. The richer the cream, the more money you make. Livingston's is the feed that pays for itself. 10

Write for free sample and prices. Dominion Linseed Oil Co., Limited, 31 Mill Street Montreal.

Livingston's Dairy Oil Cake

Better Butter—Bigger Profits!

If you wish your butter to be smooth and uniform, use the

"BRITISH" Butter Worker

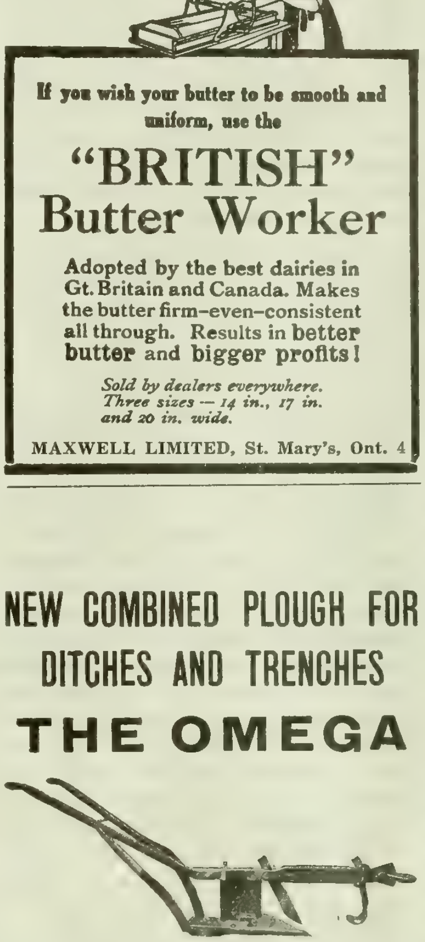
Adopted by the best dairies in Gt. Britain and Canada. Makes the butter firm—even—consistent all through. Results in better butter and bigger profits!

Sold by dealers everywhere. Three sizes — 14 in., 17 in. and 20 in. wide.

MAXWELL LIMITED, St. Mary's, Ont. 4

NEW COMBINED PLOUGH FOR DITCHES AND TRENCHES

THE OMEGA



A big advantage for farmers; no more ditches made with shovels; no more imperfect trenches. The Omega plough makes a perfect job without trouble.

A large number of ploughs are in use and give entire satisfaction.

A simple exchange of parts necessary to make trenches according to desired depth.

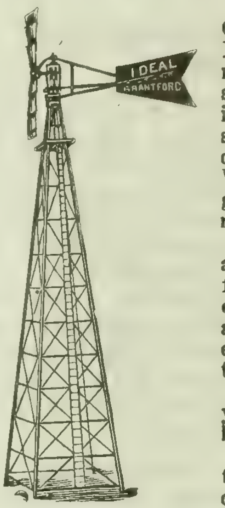
We manufacture and sell a complete line of automatic wind-mills, crude-oil and gasoline engines, hand and power fire-pumps, waterworks pumping machinery, double acting house force pumps, chemical-pumps, french burr mills, fench burr and composition millstones.

The Omega Pumps and Wind-Mill Company, Ltd.

ST. HYACINTH, QUE.

Particulars and Catalogues furnished on request.

WINDMILLS



Our Double-Geared "Ideal" Pumping Windmill has double strength. If pull-in wire breaks in storm mill goes out of gear. Wheel and Vane galvanized after made.

Our towers are girted every five feet and are double braced, and braces locked to girts where they cross.

We can supply you with the best outfit made.

We manufacture a full line of

Gasoline Engines, Grain Grinders, Saw Frames, Pumps, Tanks, Water Boxes, Concrete Mixers, Etc.

If interested send for catalogues.

Goold Shapley & Muir Co., LIMITED
Brantford, Ont.

FOR SALE

FOR SALE—Shorthorn bull Lord Kitchener—85153—calved May 15, 1911. Sire, Proud Lancaster (imp.) -68162—Dam, Buchan Fancy 5th —52150—For particulars apply to JAMES R. DODDRIDGE, New Richmond West, P. Q.

Highest Cash Prices Paid for

GINSENG

We are the largest buyers of Ginseng in America and have the greatest demand for it. We can therefore pay you the highest cash prices. If you have any wild or cultivated Ginseng, write for our latest price list, or ship what you have and we will submit you our highest offer.

David Blustein & Bro.
170 W. 27th St., NewYork, U.S.A.

within the fly itself and that they can be deposited by the fly upon human beings or upon human food.

Rapidity of Reproduction

The danger from the fly is greatly increased by the extraordinary rapidity with which the insect multiplies. The common house fly includes perhaps 98 or 99 per cent of all the flies ordinarily found in and around dwellings. A single female lays eggs at least two, and possibly four, times in the course of its life and averages probably 120 eggs on each occasion. These eggs usually hatch in less than 24 hours. Indeed, under favorable conditions, maggots may issue from them in 8 hours. These maggots grow rapidly, molting for the first time within a day after they are hatched. A day later they molt a second time, and two or three days afterwards enter the stage of pupation. Thus, the total length of their life as larvae ranges from 4 to 5 days, but this period may be greatly prolonged by low temperature or by scarcity of food. The pupal, or resting stage, lasts from 3 to 10 days, although during hibernation it may be prolonged to as long as from 4 to 5 months. Altogether, it appears that between the time the eggs are laid and the time that the adult fly emerges, a period of from 8 days upward elapses. Ten and twelve day records were very common in the experiments made to determine this point. Within 3 or 4 days after the emergence of the insect as an adult fly the female is ready to deposit her eggs. Thus, it is possible to have a new generation of flies every 11 to 14 days, and in such a climate as Washington, for instance, this will permit of from 10 to 12 generations every summer. The really effective way to get rid of this dangerous pest is to attack it in its favorite breeding place—manure.

A SEPARATOR WITH THREE COWS

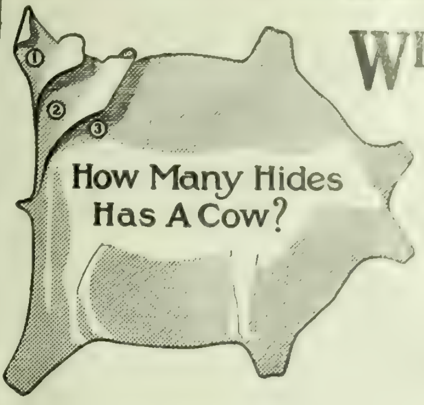
THE method of scalding the milk set in pans after the cream was partly raised, given in a recent issue of The Ohio Farmer, was a new one to me. Before the cream separator became so much in use, and most farmers' wives set their milk in pans or jars, I knew of some who scalded the milk when it was first strained into the pans. They were set on the stove until the milk presented a crinkled appearance on top, after which the pans of milk were set away until the cream was ready to be removed. As this method was only resorted to when there was trouble in getting the butter to come, I never tried it, for I have never had cream that required long churning.

A year ago, we bought a hand separator, I did not really want one; but there did not seem any very satisfactory way to take care of the milk, every way I had tried having some draw-backs. We milk three cows and thought a separator hardly worth while. But after we used one awhile, we changed our minds. During hot weather we never get much cream by any other method; but hot or cold the cream separator gets out all the cream. So by the end of the year, I found our three cows had made us $72 more than during the previous year. They had given milk the same length of time and under like conditions. Of course, the separator did not make all this difference, for butter prices were better than during the previous year. But we consider that it paid for itself before the first year was over.

CONSERVATION OF SOIL MOISTURE

IN considering the "Conservation of Soil Moisture," it is well to begin with a consideration of the requirements of our crops. It has been estimated that from three hundred to five hundred tons of water are used for the production of one ton of dry matter; that a crop of thirty bushels of wheat per acre requires nine inches of rain; and that a crop of three tons of clover hay per acre requires thirteen inches of rain. These typical facts show us what tremendous quantities of water are used by growing crops, and we must remember that if the crops cannot get the water they will not grow; in fact their yield is largely dependent upon the amount of water available during the growing season. We must remember also that the quantity of rain which usually falls during the growing season is much less than would satisfy the demands of our crops, and that, therefore, it behooves the careful farmer to husband all the water that remains in his soil from the winter's snow and eary spring rains, and also all the water that falls during the summer. How can this be done? In order to answer this question we must first understand clearly the way in which water is retained by soils and the way in which it is removed from them

If I plunge a stone into a pail of water and remove it I have noticed that a thin film of water remains sticking to the stone. If, instead of the stone, I take a handful of gravel and treat it similarly I notice the same thing happens; each small stone remains covered by a film of water, all the surplus water draining away. Now any soil is composed mainly of a number of small particles of rock and the moisture held by it is held in the form of these films surrounding or "wetting" the separate particles. Of course, one may have a soil temporarily saturated with water, i.e., with all the interstices between the particles filled with this water. But this water-logged soil will grow nothing and as it is a condition destructive to vegetation, we need not further consider it at this present time. The water, then, which is held or retained by soil is held in the form of thin films surrounding the soil particles, and a moment's thought will show you that the amount of water which a soil can thus retain is proportioned to the total surface of the particles. If the particles are few and large, as in a coarse gravel, the amount of moisture retained will be relatively small, whereas if the particles are



WHO "should worry"?

You, if you expect to buy an automobile, or if the one you own is upholstered in coated "split leather" that is rotting—splitting, and giving your car a generally disreputable appearance.

A real cow grows only one hide,—it is too thick for upholstery,—it is suitable only for shoe soles, belting, etc.

Now to produce genuine grain leather for upholstery, two thirds to three quarters of this thickness is split away, only the outermost layer being really strong enough.

To save that by-product, however, some manufacturers actually split it into two or more thin sheets, coat and emboss it to make it look like the strong, outermost grain leather. Hence two thirds to three quarters of all leather upholstery in use is coated splits.

DU PONT FABRIKOID
TRADE MARK

MOTOR QUALITY FABRIKOID
For Buggies and Automobiles

CRAFTSMAN QUALITY FABRIKOID
For Furniture

Guaranteed far Superior to Coated Splits.

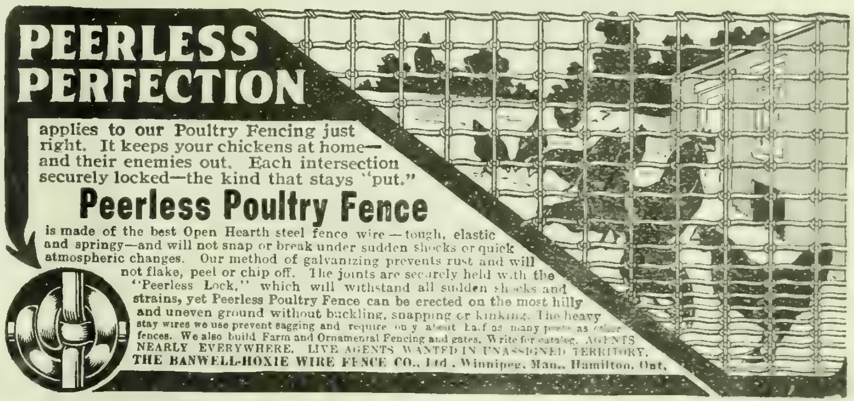
FABRIKOID is coated and embossed the same way, but with much more coating, and the backing is a fabric twice as strong as the average split. The largest automobile manufacturers use Fabrikoid on hundreds of thousands of cars with entire satisfaction and better service than they formerly got from weak splits.

In selecting a car, choose one of the many now using Fabrikoid.

Sample of either quality free. Mention your dealer's name. Or, if you send us 50c, we'll mail a large working sample 18 by 25 inches, sufficient to cover a chair, etc. Write us to-day.

DU PONT FABRIKOID COMPANY 3

"Fabrikoid" is made in Canada. Dept. 505 Toronto



PEERLESS PERFECTION

applies to our Poultry Fencing just right. It keeps your chickens at home—and their enemies out. Each intersection securely locked—the kind that stays "put."

Peerless Poultry Fence

is made of the best Open Hearth steel fence wire—tough, elastic and springy—and will not snap or break under sudden shocks or quick atmospheric changes. Our method of galvanizing prevents rust and will not flake, peel or chip off. The joints are securely held with the "Peerless Lock," which will withstand all sudden shocks and strains, yet Peerless Poultry Fence can be erected on the most hilly and uneven ground without buckling, snapping or kinking. The heavy stay wires we use prevent sagging and require only about half as many posts as other fences. We also build Farm and Ornamental Fencing and gates. Write for catalog. AGENTS NEARLY EVERYWHERE. LIVE AGENTS WANTED IN UNASSIGNED TERRITORY. THE BANWELL-HOXIE WIRE FENCE CO., Ltd., Winnipeg, Man., Hamilton, Ont.

FOUND MONEY

Subscribers wishing to take up subscriptions for the

JOURNAL OF AGRICULTURE

in their respective localities are requested to write to the manager for terms and conditions.

small and numerous, as in a clay, the amount of water held will be delatively large. Actual measurements abundantly confirm these statements, showing a water content of, say, 50 per cent in a well-drained clay soil, whereas in the gravel the water content will be, say, only 5 per cent. There are, then, wide differences in the natural capacities of soils to hold moisture, and, when one is choosing a soil for any particular purpose, it is all important to take this matter into consideration.

Every one has seen crops of clover or grass "burnt up" on light, sandy or gravelly soil by two or three weeks of hot, dry weather, when, on land inclined to clay, the same crops would be unaffected by the drought. The difference is the difference in the natural water-holding capacity of the two soils. However, when I thus compare the clay with the sand in favor of the former, I disregard a number of other considerations which must be weighed in practice, such as ease and rapidity of drainage, etc. For instance, the demands of a cherry orchard are exceedingly different from those of an oat crop, and in the choice of soils these things must be considered.

But for most of us there is no choice of soils; we find ourselves with a certain piece of land at our disposal, and we must make the most of the opportunity. We can choose what plants to grow, and in this choice is one great key to success. But we cannot change the whole texture of the soil, and must make the best use of that which nature has given us.

With so much said as to how soils hold water, let us see how they lose it. Soils lose water by sub-surface drainage, but this is in every way desirable, as it only removes the surplus water which would interfere with plant growth. Soils also lose water by evaporation into the air. When this takes place through the leaves of plants whose growth is to be fostered it is also desirable, but when it takes places from the surface of the soil or through the leaves of weeds it is a total loss, and means should be taken to avoid such losses as completely as possible. Now, when water evaporates from the surface of soil the upward flow is carried on by capillary action just as the oil is sucked up in the wick of a lamp, and in this way immense quantities of water are lost to the soil.

Now, to return to our previous question: How can the farmer conserve the soil moisture.

To a limited extent he can improve the water-holding capacity of his soil. So far as light, sandy land is concerned the admixture of a considerable percentage of humus is of advantage, so that by plowing under green crops or manure such land is not only made more fertile, but is also able to retain more moisture. Heavy land is benefited by deep plowing or sub-soiling in the fall. Experiment shows that soil thus treated retains more moisture than unstirred soil, and the only explanation I can give can be understood by describing an easy experiment. Take a lump of clay soil and immerse it in water until it is saturated. Then remove it, and one notices that the film surrounding the whole lump holds in the water and drainage is thereby impeded. But if this lump be set down on some moist cotton, drainage will at once set in and remove the surplus water. Now a heavy soil that has been stirred deeply is composed of more or less isolated lumps, each of which is enabled to hold a little more water by reason of its relative isolation than it could when in the closest contact with other portions of soil. In practice I always plow heavy soil deeply in the fall, and have had splendid results in the succeeding year's crop of oats. I have never tried sub-soiling, but would like to make an experiment some time. Another method of increasing the water-holding capacity of low soils inclined to be heavy is to underdrain. This makes the soil more porous and, by removing surplus water, actually increases the capacity of the soil to retain moisture in times of drought.

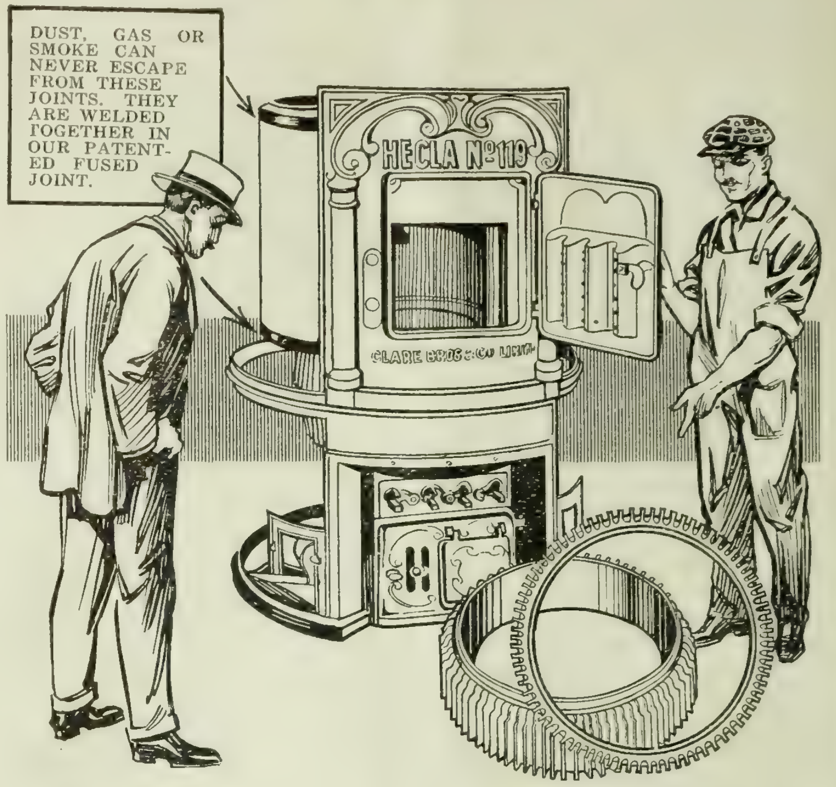
But the main effort of the farmer must be to prevent useless evaporation from the surface. This can be done in a variety of ways which I shall briefly enumerate:

1. By surface cultivation. Whenever possible the frequent stirring of the soil maintains a dust mulch that acts as an effective blanket and protects the soil underneath from evaporation. The theory of this is that the capillarity of the soil is broken and the sub-surface moisture prevented from rising. The loose soil on top dries out, but the soil beneath is protected. Every farmer knows how moist and mellow a cultivated field remains while a piece of land alongside, left hard on top, loses practically all its water during a prolonged dry spell. Surface cultivation also renders the soil porous, and heavy rains coming during the summer soak in instead of running off. This is especially true of hilly clay land. It is particularly advantageous to cultivate after a good rain, just as soon as the land is fit to stir. By thus doing the dust mulch destroyed by the rain is restored, and the water conserved for the use of the plants.

The effectiveness of soil mulches depends upon a number of factors, such as the nature of the soil, the thickness and coarseness of the crumb structure, the frequency of stirring, etc. A mulch in heavy land is more effective than one in light land, especially if the little lumps of soil are not too large, say from the size of a pea to that of a walnut. In practice, a two-inch mulch is a good one, and stirring once a week is often enough.

2. By the use of straw or vegetable mulches. This is rarely capable of extensive application, but is useful in connection with the top dressing of a bare sod with manure. It is a good method, too in the protection of young trees, shrubs, etc., against drying out. Many young trees that are annually lost could be saved if they were mulched with plenty of strawy manure.

(To be continued)


DUST, GAS OR SMOKE CAN NEVER ESCAPE FROM THESE JOINTS. THEY ARE WELDED TOGETHER IN OUR PATENTED FUSED JOINT.
HECLA No 119
CLARE BROS & CO LIMITED

"This Fire-Pot Save Tons of Coal"

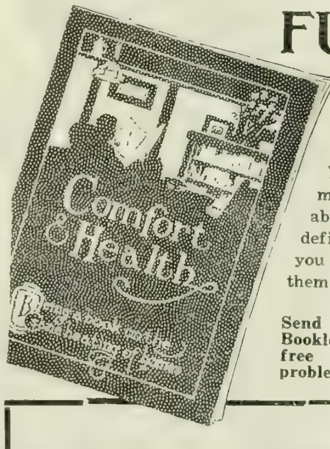
THAT is because it delivers heat quickly. All around it steel ribs are welded into the casting. They give the pot three times the ordinary heating surface. They draw out the heat from the burning wood or coal and send it on to heat the house. They save the heat for you instead of driving it out the chimney. In actual tests that saving amounts to one ton in every seven. NO other furnace has this coal-saving Fire-Pot. NO other furnace can give thorough heating from as little fuel.

Think of this when you order your furnace. Think of the economy year after year that Hecla owners are able to make.

Mellow Air Free From Dust, Gas and Smoke

No matter how long you use a Hecla Furnace, gas or dust can never escape from the fire into the warm air that heats your house. We guarantee this for the life of the furnace. And your Hecla supplies mellow, healthful heat. Never that dry heat that is so oppressive. The Hecla provides moisture in plenty.

HECLA WARM AIR FURNACE



Before deciding on a furnace you should read our little booklet, "Comfort and Health." You can learn from it many valuable points about heating. If you wish definite plans and quotations, you are free to command them from our heating experts.

Send the coupon for the Booklet to-day, or write for free advice on any heating problem.

Clare Bros. & Co. Limited, Preston

Send Free "COMFORT & HEALTH"

. . . .

. . . .

J.-A.

$120.00 turned this pretty 9-roomed house of Mrs. Jacob Sadler's, Heidelberg, Ont., into a cosy home. Burned only 3 tons of coal last winter.

L. B. Stouffer, Plattsville, heats this large house with a Hecla that cost only $160.00 to install. He gets summer comfort for 7 tons of coal.

A. E. Ball's residence at Hanover, Ont. It cost just $115.00 to install a Hecla, and less than six tons of coal keeps the house comfortable all winter.

This large residence at Roseville was fitted with a Hecla Furnace at a cost of $105.00. N. B. Bricker, the owner, says he keeps it cosy with 3½ tons of coal.

J. D. Moore, County Registrar, North Dumfries, heats this 12-roomed home with 7 tons of coal. $160.00 paid for the Hecla Furnace complete.

The JOURNAL of AGRICULTURE

AND HORTICULTURE

OCT 7 1915

Volume 19 *October 1st 1915* *Number 4*

APPLE PACKERS AT WORK

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

King George's

Navy Plug

This popular Chewing Tobacco is first favorite in the Navy, the Allied Armies and with the general public.

Taste the lingering flavor !

There's the whole secret of its huge popularity. It's Canada's Pride. Choicest tobaccos skillfully blended and prepared by our expert Canadian workers. Fragrant, juicy and spicy. Does not sting. Good in peace and war — Try it !

MADE IN CANADA

For Sale Everywhere - 10c a Plug.

The Rock City Tobacco Company, Limited, Manufacturers

QUEBEC - CANADA.

GLOWING
WARMTH

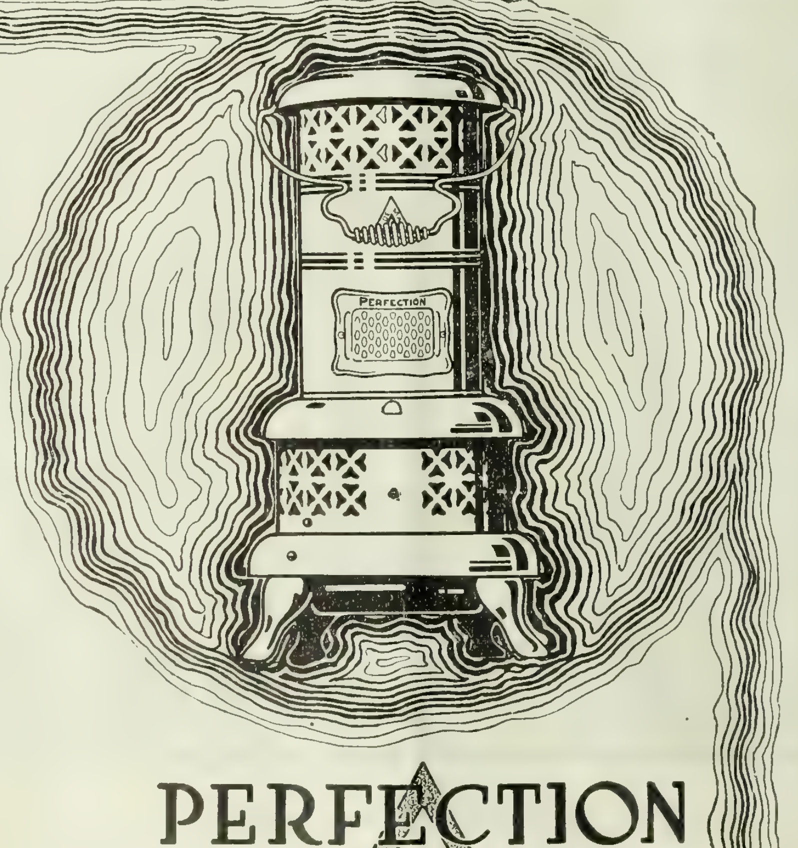
at a minute's notice with the Perfection Oil Heater.

Why start up the big stove or furnace when a Perfection will give you just the heat you want for these chilly nights and mornings?

No wood to cut, no coal to carry. Gives 10 hours of comfortable heat on a gallon of *Royalite Oil — the economical fuel.*

THE
IMPERIAL OIL COMPANY
Limited

BRANCHES IN ALL CITIES



PERFECTION
SMOKELESS OIL HEATERS
MADE IN CANADA

Wonderful New Coal Oil Light

Burns Vapor Saves Oil **Beats Electric or Gasoline**

Awarded GOLD MEDAL at World's Exposition San Francisco

Scientists say its White Light is nearest to daylight in color

10-Days FREE TRIAL

Send No Money, We Prepay Charges

We don't ask you to pay us ***a cent*** until you have used this wonderful modern light in your own home ten days—we even prepay transportation charges. You may return it at our expense if not perfectly satisfied after putting it to every possible test for 10 nights. You can't possibly lose a cent. We want to prove to you that it makes an ordinary oil lamp look like a candle; beats electric, gasoline or acetylene. Lights and is put out like old oil lamp. Tests at 33 leading Universities and Government Bureau of Standards show that it

Burns 70 Hours on 1 Gallon

common coal oil, and gives more than twice as much light as the best round wick open flame lamps. No odor, smoke or noise, simple, clean, no pressure, won't explode. Children run it. Several million people already enjoying this powerful, white, steady light, nearest to sunlight. Guaranteed.

$1000.00 Will Be Given

to the person who shows us an oil lamp equal to the new ***Aladdin*** (details of offer given in our circular.) Would we dare make such a challenge if there were the slightest doubt as to the merits of the ***Aladdin?***

Men Make $50 to $300.00 per Month With Rigs or Autos Delivering the ALADDIN on our easy plan. No previous experience necessary. Practically every farm home and small town home will buy after trying. One farmer who had never sold anything in his life before writes: "I sold 51 lamps the first seven days." Another says: "I disposed of 34 lamps out of 31 calls.". Thousands who are coining money endorse the ALADDIN just as strongly.

No Money Required

We furnish capital to reliable men to get started. Ask for our distributor's plan, and learn how to make big money in unoccupied territory. **Sample Lamp sent for 10 days FREE Trial.**

We want ***one user in each locality*** to whom we can refer customers. Be the first and get our special introductory offer, under which you get your own lamp ***free*** for showing it to a few neighbors and sending in their orders. Write quick for our ***10-Day Absolutely Free Trial.*** Just say, "Show me how I can get a strong white light from coal oil, ***without risking a cent.***" Address nearest office.

MANTLE LAMP CO., 229 Aladdin Building
Largest Coal Oil Mantle Lamp House in the World
Montreal Winnipeg

ABSORBINE
TRADE MARK REG. U.S. PAT. OFF.

will reduce **inflamed, swollen Joints, Sprains, Bruises, Soft Bunches; Heals Boils, Poll Evil, Quittor, Fistula, or any unhealthy sore quickly** as it is a positive antiseptic and germicide. Pleasant to use; **does not blister** under bandage or remove the hair, and you can work the horse. $2.00 per bottle, delivered. **Book 7 K free.**

ABSORBINE, JR., antiseptic liniment for mankind. Reduces Painful, Swollen Veins, Goitre, Wens, Strains, Bruises, stops pain and inflammation. Price $1.00 per bottle at dealers or delivered. Will tell you more if you write. Manufactured only by
W. F. YOUNG, P.D.F. 134 Lymans Bldg., Montreal, Can.
Absorbine and Absorbine, Jr., are made in Canada.

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE

AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 97,151
ENGLISH, [illegible]
FRENCH, 87,331

Volume 19

OCTOBER 1st 1915

Number 4

EDITORIAL

THE NEW DEPUTY MINISTER OF AGRICULTURE

Mr. Antonio Grenier, Secretary of the Department of Agriculture of Quebec, is appointed Deputy Minister in place of the late Mr. G. A. Gigault

WE have pleasure in announcing to our readers that Mr. Antonio Grenier, Secretary of the Department of Agriculture and acting deputy minister since the death of Mr. G. A. Gigault, is officially appointed deputy minister of agriculture by the government of Quebec.

To the various departments, and particularly the department of agriculture, the appointment of Mr. Grenier, far from being a surprise, is a matter which has been expected, but which none the less has been received with great pleasure. Everyone agrees in saying that Mr. Grenier is in every way fully qualified for the important charge which the provincial government has conferred on him, and that he will be a worthy successor of his predecessor, Mr. Gigault.

Mr. Antonio Grenier, Deputy Minister of Agriculture for the province of Quebec.

Mr. Grenier was born at Plessisville on October 1st 1886, and is now 28 years of age. He was educated at the seminary at Quebec and at the faculty of Arts. He took his law course at the Laval University, Quebec, and was made a barrister in 1911. He has acted as secretary of the department of agriculture since 1912, and was appointed acting deputy minister on the death of Mr. G. A. Gigault. Mr. Grenier was a partner in the firm of Plamondon, Grenier and Bedard, lawyers, before entering the service of the provincial government.

Mr. Grenier has received numerous congratulatory messages on his appointment, and there is no doubt that his nomination will be good news to many who know him and who have had the pleasuse of coming in contact with him. He will be to the Hon. J. Edward Caron, Minister of Agriculture, an able assistant in the increasing work which he is carrying on for the development of the province from an agricultural standpoint. We offer Mr. Grenier our hearty congratulations.

BOYS' PRIZES AT THE INTERNATIONAL FAT STOCK SHOW

A short notice has already been published in regard to the prizes which are to be awarded to boys' entries at the International Livestock Show at Chicago this fall. First prize of $50 is to be awarded to the boy under 16 years old who fits the best steer 30 months old or younger; a like amount goes to the one who enters the best pen of three barrows; also to the boy showing the best pen of three lambs. Second to fifth prizes range from $40 down to $10. Give the boys a chance and see how much interest they will take in caring for their prospective show ring winners. No entry fees are to be charged. Write to B. H. Heide, Sec'y, Union Stock Yards, Chicago, Ill., for entry blanks.

CIRCULARS OF THE DEPARTMENT OF AGRICULTURE

THE Provincial Department of Agriculture is publishing a series of brief practical circulars upon a variety of agricultural subjects. The latest of those received are No. 8, Drainage Plans for Farmers, and No. 9 Fruit-tree Culture. The former outlines the offer of the Hon. J. Edward Caron to have drainage plans prepared for farmers free of charge and explains why and how land should be drained. Circular No. 9 is addressed to all holders of a lot of land and invites them to send their names and addresses to the Chief of the Fruit Branch, Department of Agriculture, Quebec, so that the Department may be in position to send them helpful information. A number of hints and recommendations are given in the circular itself.

Among the subjects treated in previous circulars of the series are poultry keeping and maple sugar making.

MUST OUR RURAL TEACHERS BE MADE CIVIL SERVANTS ?

ACCORDING to Professor Sinclair Laird, Head of the School for Teachers, Macdonald College:

"The curse of rural education in Canada and the United States is the system of decentralized school administration with its small school boards of three or five local farmers whose interest is not in education, but in a low education tax. Another hindrance is that too little financial support is given from each government and too much is raised locally; thus the locality has too much power and sufficient pressure cannot be brought to bear by the Department of Education to secure improvement. From this point of view the only salvation lies in greater government support and consequent greater control. Indeed, if education were a civil service as in France, controlled without political interference, there are enough educational experts in Canada to manage education satisfactorily if they had a free hand to exercise their profession, just as officials do in the navy".

This is not flattering to our farmers, but we fear there is only too much truth in the charge that local school authorities are usually more interested in low taxes than in efficient education. There are objections to centralization also, particularly that it tends to crush out originality in those who are genuinely interested in education—teachers as well as trustees. But if our farmers do not make better use of the powers now entrusted to them the demand for centralization is likely to grow.

PLOUGHING MATCHES

THE importance of good ploughing, the fundamental tillage operation, has perhaps been less appreciated during the last two decades than in the earlier agricultural history of Canada. Ploughing matches were more common thirty or forty years ago than they are to-day. Of late, however, interest in ploughing and in ploughing matches appears to be reviving. The Agricultural Gazette for August contains reports from Nova Scotia, Quebec, Ontario, Manitoba and Saskatchewan, which indicate a widespread and growing interest in this useful kind of contest.

In Nova Scotia the ploughing match has never taken deep hold—which is surprising in view of the difficulty of doing good work in the dyked marsh lands characteristic of that province. The progressive county of Pictou has, however, held

CONTENTS

EDITORIALS:—The New Deputy Minister of Agricultural.—Boy's Prizes at the International Fat Stock Show.—Circulars of the Department of Agriculture.—Must our Rural Teachers be made Civil Servants?—Ploughing Matches.—The Illumination of Joseph Keeler, Esq., or On, to the Land. —Seaweed as Fertilizer.—Notes on our Neighbours.

ORCHARD AND GARDEN.—Mushroom and Toadstools.—Cider Vinegar.—Apple Sirup.—Planting Bulbs.

FARM AND FARM CROPS.—Sherbrooke Exhibition. — Agricultural Conditions in Richmond County.—Ploughing Matches. — Seed Growing Centres in Quebec.

LIVE STOCK.—Live Stock at Canada's great Eastern Exhibition, 1915. — Some Flocks, Herds and Farms of the Bedford District.—Does it pay to feed Cows at Grass?—Karakul Sheep.—Auction Sale.

DAIRY.—Quebec Butter again Victorious.—The Problem in Buttermaking.

POULTRY.—Suggestions for Fair Managers.—Model Prize List. — Poultry at Sherbrooke Fair.—Fattening Poultry for Market.

WOMAN'S WORLD. — Cowansville Homemakers' Club.—Foods and Food Preparation.

GENERAL INTEREST.—Conservation of Soil Moisture.—Reducing Dairy Costs.—Farmers should be Students.—The Divining Rod.—Dealing with Life and Dealing with Things.—Wisconsin Banks do accounting for farmers. — Improvement of Wool Clip.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

LIKE CURES LIKE.—"Now, Willy", said the mother, "you told me a falsehood. Do you know what happens to little boys who tell falsehoods"?

"No, ma'am", replied Willy sheepishly.

"Why", continued the mother, "a big, black man with only one eye in the center of his forehead comes along and flies with him up to the moon, and makes him pick sticks for the balance of his life. Now, you will never tell a falsehood again, will you? It is awfully wicked!"—*Ladies' Home Journal.*

WISE MO.—"Why", asks a Missouri paper, "does Missouri stand at the head in raising mules"?

"Because", says another paper, "that is the only safe place to stand".—*Christian Register.*

contests the last three years. In Ontario ploughing matches have always been encouraged by the Provincial Government. Forty years ago local matches were common, but interest in them flagged after a time and it was not until 1911 when the Ontario Ploughmen's Association was organized by Mr. J. Lockie Wilson, that this feature of agricultural effort came into prominence again. This new Association receives a grant from the Government, part of which is reserved to pay the expenses of the Provincial match, the remainder divided among the branch associations. Each branch association holds a contest and only the prize winners in these local contests are allowed to compete in the provincial match. The provincial match, accordingly, bringing together the best ploughmen of the province, is an event of wide interest. The average attendance at the three matches which have been held has been 2000. The number of competitors last year was 80.

In Manitoba the Government has given encouragement to ploughing matches for twenty years or more. A few years ago the agricultural societies took up the idea and now over twenty matches are held annually. In Saskatchewan this year between sixty and seventy matches are being held under the general supervision of Mr. S. E. Greenway, the Director of Agricultural Extension in the University of Saskatchewan. This gentleman is a firm believer in the advantages of the ploughing match as a means of promoting good ploughing and, consequently, good farming. In another column we print an extract from his article upon the subject.

About our own province the information given in the Gazette is less definite. Agricultural societies and Farmers' Clubs are not only permitted but also encouraged to use a portion of their Government grants in organizing ploughing matches. Some associations require competitors to have at least five acres of ploughing ready for inspection, while others bring the ploughmen together for a five or six hour contest. How many competitions are held in the province does not appear either from the item in the Gazette or from the Minister's report. We should be glad to receive reports of ploughing matches from the Secretaries of Societies holding them. Such contests are unquestionably well worth while.

THE ILLUMINATION OF JOSEPH KEELER ESQ., OR ON, TO THE LAND

A Story of High Prices

THIS is the title of a timely booklet prepared by Dr. P. H. Bryce, Chief Medical Officer of the Dominion Immigration Department, Ottawa. It is a story of high prices, and it endeavors to show how depopulation, lack of capital, low production and lack of co-operation and business methods in the rural districts have all been instrumental in bringing about the present area of high prices.

The story centres about the family of Joseph Keeler, a wealthy Toronto wholesale merchant, and the grandson of a prominent U.E. loyalist who had settled near Brighton on Lake Ontario about 1794, and who had shared the trials and discomforts of early settlement times which were described by his partner-in-life as "halcyon days". Joseph Keeler and his family move in the best society circles in the city, and the daily rounds of their lives are far removed from those of their almost forgotten ancestors who helped to make the district of Brighton a thriving settlement.

It happens, however, that Mr. Keeler runs across a paper in the procedings of the Ontario Historical Society, where he reads with much interest an account of the early settlement at the Eastern end of Lake Ontario in which his grandparents had taken a prominent part. The story is a revelation to him, and he takes an early opportunity of visiting the district with his youngest son. He is impressed with what he sees,—first with the natural beauty of the farms, and second with the inertia or the lack of enterprise everywhere. There is something wrong, he concludes, with rural life where such a condition prevails, and he sets about in his own way to investigate.

With the aid of government statistical papers and the trained mind of his friend, the Professor of Economics in the University, he is able to trace the causes that produced the present condition of things. Up to the sixties the great majority of the people were rural. Most of the people brought in from the mother country took up land, and the repeal of the Corn Laws provided a good market for wheat. After the American Civil War, however, immigration from Europe focussed on the States, and Canada entered on a period of hard times. Tens of thousands of her young men and women of the rural districts crossed the Line. With the revival in the eighties and nineties, when the North-West was opened up, further immigration took place from the farms of the Eastern provinces and with the great influx of money great business enterprises were built up in the cities which drew still further upon the rural people.

The result was the depopulation of the country districts, and corresponding increase in the population of the cities. The lack of labor and capital on the farms prevented any appreciable increase of farm products, and as a consequence the increase in population of the country as a whole brought up the cost of living.

Mr. Keeler and his friend the Professor next take up the question of providing a remedy for the situation. They get suggestions from the good work done in Sweden, Denmark, Ireland and England with regard to the application of co-operative principles in the buying and selling of farm produce, and in forming "credit societies" where money may be obtained at reasonable rates and terms for the purpose of making necessary farm improvements.

It is also evident that the farmer must become more efficient, and with the increase of wealth will come a better social spirit and better co-operation. The rural schools, too, must be improved so that the children will learn those things that are a preparation for their life work. Moreover, in a country where one half of the population is rural there should be as many young men at the Agricultural Colleges as at the other colleges of the Universities. As a matter of fact the non-agricultural students are ten or fifteen times more numerous than the agricultural students.

Partly as a result of these discussions, and partly as the result of the effect of the unnatural artificial life of the city on his family, Mr. Joseph Keeler goes back to his ancestral home and buys a tract of land for his youngest son who has a desire to farm. Through his influence the community prospers on account of the introduction of co-operative and business methods, and "halcyon days come again along the lake shore".

Such in brief is the substance of "The Illumination of Joseph Keeler, Esq.," In this pamphlet Dr. Bryce does not introduce new facts but he presents his facts in such a way that the reader sees at once their significance. The main value of the pamphlet lies in the directness with which the whole rural problem is discussed. The causes of the situation and the remedy are both clearly outlined. It is hoped that the little work will be widely read both in town and country for both are concerned with the problem. It is for sale at Jas. Hope and Sons, Ottawa.

SEAWEED AS FERTILIZER

IN the August number of the Agricultural Gazette, Dr. F. T. Shutt, Dominion Chemist, reports that the outlook for the production of a commercial fertilizer from seaweed in Nova Scotia is most promising. Seaweeds are essentially potassic fertilizers and for that reason are of special interest while the products of the German mines, which have been supplying the world with potash, are shut out of the British Empire by the exigences of war. But besides potash, seaweeds also contain notable quantities of nitrogen and small amounts of phosphoric acid. Hence they are to a certain degree complete fertilizers. The readiness with which they decompose in the soil enhances their manurial value. Fresh seaweed, however, contains 65 to 85 per cent of water. This makes it unprofitable to ship the fresh material any distance inland. The problem which the Dominion Chemist has undertaken to solve is to dry and grind the seaweed economically. Experiments in this direction have been in progress during the summer at Clarke's Harbour, Nova Scotia. A considerable quantity of the finished product has been obtained and its analysis and physical condition go to show that it will prove a valuable manure, rich in potash and nitrogen.

NOTES ON OUR NEIGHBOURS

THE Regina Exhibition Board held a farm boys' camp July 27th to 31st, which was attended by over two hundred boys of 14 years of age and over. Four hours daily were devoted to competitions in stock judging, grain judging, identification of plants, and demonstrations. Towards the support of this enterprise the Canadian Men's Credit Association of Winnipeg has promised $1,000 a year for three years.

The Manitoba Agricultural College this year varied its custom of sending out a "Better Farming Special" train by making use of the automobile. The whole college staff and several additional lecturers have been motoring about the province in groups of four and five, holding meetings in school houses, churches and groves. Besides carrying agricultural information and inspiration to places remote from the railways, this plan has the additional advantage of affording opportunity to the lecturers to visit farms and get better acquainted with the agricultural conditions of the province.

❖ ❖ ❖

The Ontario Department of Agriculture, through its district representatives, has taken a census of pure bred live stock in the various counties of the province. It is thought that the publication of the names and addresses of all breeders with the breed of live stock and the number and ages of the pure-bred animals owned will materially assist buyers in locating stock and will be of particular advantage in bringing the smaller breeders into notice. It is the intention to repeat the census at intervals so as to keep the information up to date.

❖ ❖ ❖

The British Columbia Department of Agriculture offers prizes for apple packing at the fairs held by the Agricultural Associations. Each contestant packs three boxes and the points considered in scoring are:—Speed (20), uniformity (15), alignment (10), bulge (10), height at ends (10), firmness (20), wrapping (15). The prizes, provided five competitors enter, are $15, $10 and $5.

Manitoba now has sixty consolidated rural schools. Some of them have courses in agriculture and the beginning of some work in home economics. Almost without exception the sites of these schools comprise from five to ten acres of ground and in several cases residences for teachers have been built.

❖ ❖ ❖

A qualified apiary instructor was this year sent on tour by the Ontario Department of Agriculture to show how to examine hives for disease. He actually put a colony through the treatment for cure. Other manipulations were shown, such as finding the queen, removing bees from supers, operating to prevent swarming, etc, etc., Prominent local beekeepers were asked to take part and assist in the discussion of practical questions. Ladies were especially invited, and were advised to take veils so that they could go right out into the apiary with comfort.

❖ ❖ ❖

Ontario is this year holding 234 schools fairs, in which 1865 schools are taking part. 4621 "war-plots", 2 rods by 1 rod, were planted with potatoes and it is estimated that the children will turn over about $24,000 to the Red Cross fund from the produce of these plots.

THE GARDEN AND ORCHARD

MUSHROOMS AND TOADSTOOLS

IN pastures, lawns and roadsides at this time of the year, especially after a rain, many kinds of mushrooms and toadstools may be found. They are interesting objects of study. Unlike other plants they are unable to make their own food, and are dependent upon decaying vegetable matter for their living. They are also interesting because the edible forms, or mushrooms, make delicious dishes when served and cooked properly.

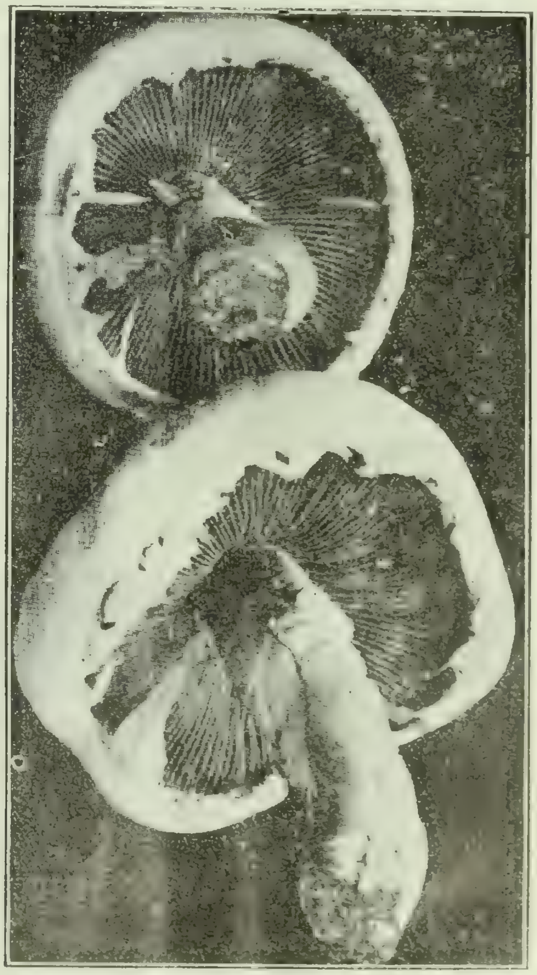
Not every person, however, is able to distinguish the edible from the poisonous forms, and deaths occur every year from eating poisonous forms that resemble edible ones. Apparently there are far more non-poisonous than poisonous forms, and the expert enjoys many delicious repasts upon fungi which the ordinary person thinks poisonous.

There is no hard and fast rule for distinguishing edible forms from poisonous, but if the following advice be followed, little danger need be feared.

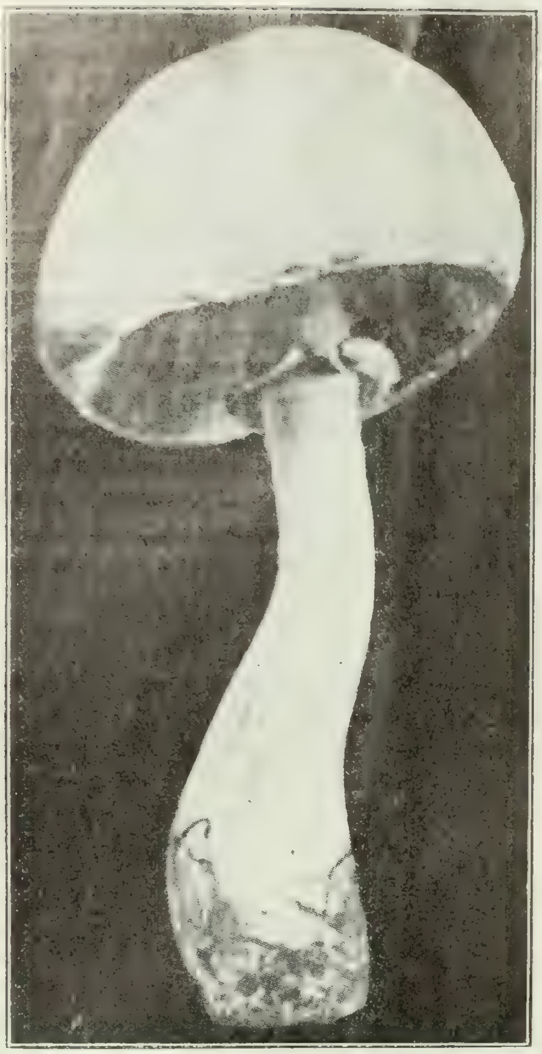
1. Do not eat the young or *button* forms, as they are much alike in all species, good and bad alike.
2. Do not eat a fungus with a cup-like structure at the base of the stem. The most deadly forms like the Amanitas have a cup.
3. Do not eat fungi whose flesh changes colour quickly after bruising or breaking.
4. Do not eat fungi that have a sticky cap.
5. Do not eat fungi that are brilliantly coloured.
6. Do not eat fungi that have a milky juice.

The Glistening Coprinus—Edible before they begin to turn black.

In each of the sections mentioned above are edible forms which the expert enjoys, but inasmuch as there are several poisonous forms it is well for the inexperienced to follow the advice given and not



The Common or Field Mushroom—with pink gills—edible.



Lepiota — an edible mushroom with white gills, common on lawns and pastures in Autumn.

to run any danger.

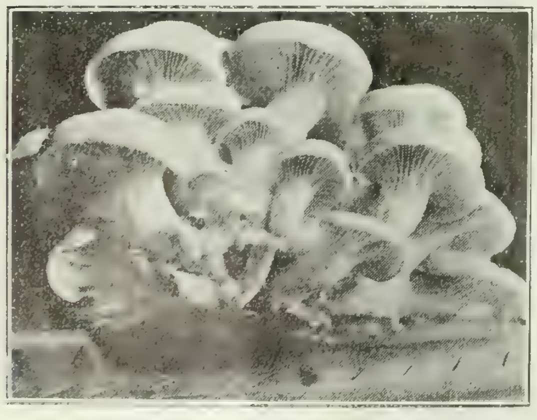
COMMON EDIBLE MUSHROOMS

The most common mushroom is the *Field Mushroom* (Agaricus campestris), which is also the species commonly cultivated. The cap is white or brownish, smooth or somewhat scaly; the flesh white; the stem cylindrical and solid, usually with a ring near the top. The gills on the under side of the cap are white when young, but soon become *pink*, changing to purple-brown as the plant becomes old. There are several related species of Agaricus, all edible.

Three or four species of *Coprinus* are common and edible. They are easily recognized by their cylindrical caps and black gills which dissolve at maturity into a black fluid.

Another group of edible forms are the *Lepiotas*, which resemble the common mushroom but have *white* instead of pink gills.

Several edible species of *Pleurotus* or *Oyster Mushroom* are common on tree stumps and trunks, —the *Oyster Agaric*, the *Elm Pleurotus* and the *sapid Pleurotus*. They are readily recognized by their place of occurrence and by the fact that the stem is not attached at the centre of the cap and has no ring.



Oyster Mushroom, edible, common on stumps and trunks of trees.

Another delicious mushroom is the *Chanterelle*. It is yellow and grows in woods on the ground. It may be recognized by its irregular top shape.

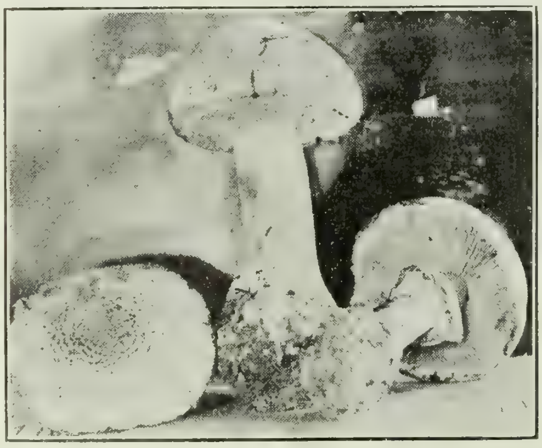
Several of the *Milk Mushrooms*, belonging to the genus Lactarius, are edible in spite of the fact that they exude a milky or coloured juice when broken. The *delicious lactarius* has orange-coloured juice, and is of a dull orange colour with its cap marked by concentric zones of darker colour. It grows in damp woods and is easily recognized. The *orange-brown lactarius* is another edible form growing in damp woods. Its cap is dull orange or tawny, and the juice is white.

A group of fleshy fungi, usually highly colored and closely related to the *Milk Mushrooms* are the *Russulas*. These, however, lack the milky juice. The *smooth russula*, with a reddish cap and stem and white gills, and the *leathery russula*, with a reddish or purplish cap and the gills reddish-brown, are both edible. They occur in mixed woods.

All the foregoing mushrooms have plate-like gills underneath the cap, but the *edible Boletus* has a porous under surface to its yellowish brown cap. It grows mostly in or along the borders of open woods. The *rough Boletus* grows in similar situations and has its stem roughened with dark brown scales. It is also edible.

The *Puff-balls* when young and the flesh white are edible. The *giant puff-ball* is common in fields and often grows to a large size.

The *Morel*, although not a true mushroom, is one of the best edible of the fleshy fungi. It grows on the ground in damp places in the spring. The stem is stout and the cap is elongated and deeply and coarsely pitted.



The Fly Agaric or Amanita—poisonous.

There are many other edible mushrooms but those mentioned above are the best as well as the most common. If possible an expert should be consulted whenever any doubt occurs as to the edibleness of the mushroom collected. It is wise to err always on the safe side and to reject any form which is doubtful.

SOME POISONOUS TOADSTOOLS

The most dreaded Toadstools are species of *Amanita*— the *deadly Amanita*, the *destroying angel*, the *fly Agaric* and others. They resemble the Lepiotas to some extent in having white gills and a ring on the stem, but differ in having a *volva* or *cap* at the base of the stem. The *deadly Amanita* has in general a whitish or greyish cap which is slimy when moist, but it varies greatly in appearance. It usually occurs in or along the margins of woods.

The *destroying angel* is entirely white and is by some authorities considered a variety of the *deadly Amanita*.

The Giant Puff ball—edible when flesh is white. Common in pastures.

The fly Agaric has an orange-yellow cap which stands out in deep contrast to the white stem and gills. It occurs along fences and borders of woods in early autumn.

In spite of their deadly poisonous nature, symptoms of poisoning do not usually occur until some time after they have been eaten. A physician should then be called in at once.

Russula emetica is a poisonous toadstool which grows on the ground in woods or open places. Its cap is red or rose-color, the skin easily peeling off, and the margin deeply furrowed and warty along the ridges. The stem is white or reddish and the flesh has a peppery taste.

Boletus felleus, one of the pore or tube mushrooms, is poisonous. It resembles the *edible Boletus, but the under surface of the cap is pink, and it has a bitter taste.*

STRUCTURE AND HABITS.

Mushrooms and toadstools are simple plants. They are composed of a large number of fine thread-like tubes, joined together. The part above ground is the most conspicuous, being umbrella-shaped in most cases. This whole structure corresponds to the fruiting part of other plants and produces millions of fine dust-like spores on the gills or tubes. Each spore, if it meets with favorable conditions when it falls, is able to produce another mushroom like that from which it originated. The feeding or vegetative part of the mushroom is in the ground, and consists of a large number of fine fungal threads which penetrate the decaying vegetable matter and absorb nourishment. Sooner or later bud-like processes arise on these threads, which develop first into *buttons*, and later, on pushing through the surface of the ground, into the structure called the mushroom.

W. L.

CIDER VINEGAR

The By-Product That Saves Dollars

By G. J. Culham, B.S.A.

A DRIVE THROUGH THE RURAL DISTRICTS of Ontario in the early or late fall leaves several impressions. Of these, one of the outstanding is the more or less large amount of apples going to waste. Many orchards remain unpicked, and those having been picked show still plenty of apples left. Why should this state of affairs exist; is there no possible use for these culls and wind-falls other than feed and manure? Cider and cider-vinegar making should to some extent help solve the problem and at the same time return a fair rate of any capital invested.

The manufacture of cider vinegar on the farm is not uncommon, yet it is not as prevalent a practice as it should be. Wherever apples are grown there is an opportunity of producing a good quality of cider vinegar and such vinegar can readily find a market. Cider vinegar is second only to wine vinegar in flavor and will therefore be used in the household in preference to the more expensive wine vinegar or less tasty chemically prepared wood vinegar.

How to Manufacture Vinegar on the Farm

Only ripe apples should be used. Most of the common varieties available will do when ripe, but they do not contain enough sugar when green. The apples must be clean, not decayed or overripe. Dirty apples are apt to carry bacteria of an undesirable nature into the juice which would cause various bad flavors in the vinegar.

The juice is removed from the fruit by grinding and pressing. If the manufacture of vinegar is to be made on a more or less large scale a cider press will be necessary; if on a small scale a small hand press may be used. The large presses are expensive to instal and operate and need a special building and power outfit. The hand presses are of very small capacity and only small quantities of vinegar could be made with them. If there is a cider mill in the vicinity it would be better to make use ot it. The cost of grinding and pressing the apples is low compared to the installation of private presses. The presses and other utensils which are apt to get dirty, should always be kept very clean, for here again harmful bacteria and yeasts may enter the juice and spoil the vinegar.

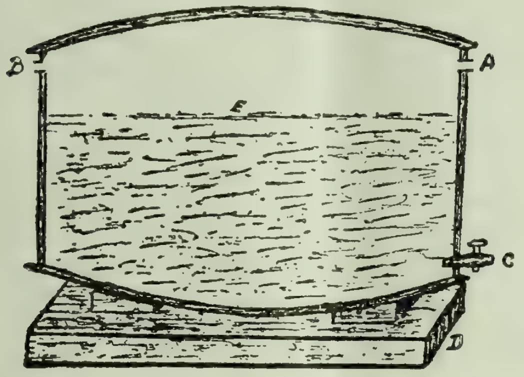


Fig. 1.-A and B, openings protected by cheese cloth. C, spigot. D, stand. E, surface of liquid.

In the manufacture of cider vinegar two important fermentations play a part: alcoholic, where the fresh apple juice is fermented by years and 5 to 10% of alcool is produced; acetic fermentation, which turns the alcohol into vinegar and is caused by bacteria of a certain kind which make up the "Mother"; 4 to 5% of acid is produced. Both processes are necessary for vinegar making; they must be kept distinct or poor results will follow.

The steps as here outlined will keep these two fermentations distinct.

Be Sure the Barrels Are Clean

The barrels to be used should be new or cleaned in such a way that all traces of the previous contents are removed. Should any be left it will spoil the flavor of the vinegar, also it may stop the fermentations altogether and the whole process will then be a failure. Thorough washing with scalding water should be given even when the barrels have been recently used for cider or vinegar. The forty-gallon barrel is the most serviceable size.

Before putting the apple juice into the barrel it is well to let it stand for two or three days in an open end barrel to let some of the solids settle out. Then the juice is drawn off carefully, so that the settlings will be undisturbed, and put into a closed barrel, as shown in figure 1. At all times it is well to try to get rid of any settlings, as by doing so, a clearer, brighter and therefore more attractive vinegar is made. Metal ware should be carefully avoided throughout all operations.

Alcoholic Fermentation

When the barrel is about half filled it should be put in a cellar or room where the temperature runs between 45° and 60° F. This is the best temperature for the yeasts to grow and to produce a maximum amount of alcohol. The apple juice usually contains the right kind of yeasts, but to make certain and to make the fermentation more rapid, it is well to add yeasts. The best yeast to add is bakers' yeast, one small cake to 5—10 gallons of juice. Any of the yeast used in the home for bread making will do. The cake should be dissolved in a few pints of water and then thoroughly mixed with the juice. By adding the yeasts, alcoholic fermentation will be complete in about three months, if the temperature is right. If the temperature is a little too low or if no yeasts have been added, it will be probably twice that time.

Acetic or Vinegar Fermentation

When alcoholic fermentation is completed it is well to again draw off the top liquid and avoid settlings. The barrel should be well washed out and the clear liquid replaced. Though it is not absolutely necessary it is better to then add 2-4 quarts of old vinegar which contains the "Mother of Vinegar". The barrel must be on its side and not more than two-thirds full; this gives a large surface exposed to the air. The more air admitted in this way the more thorough will the fermentation be. The temperature at which the barrels are kept will make a big difference in the time to complete the fermentation. At 50 to 70° F. it will require 18 to 24 months; in a warmer place, 12 to 18 months. If a good mother has been added and the temperature is high it will be complete in 6 to 12 months.

In the method just described only one barrel is needed, but the process is slow and only small quantities can be made. To make larger quantities a large number of barrels would be required and therefore much more room. To avoid this there is another method which if followed will give the best quality of vinegar in the minimum amount of time.

Figure 2 shows the barrel used. An ordinary barrel is fitted out cheaply with the necessary funnel and tubing. The barrel is half filled with the fermented juice and the mother added. At the end of three to four weeks, in a warm room, one-fourth of the liquid may be drawn off by the lower bung. The barrel must not be disturbed. The amount drawn off is replaced by the same amount of new liquid and is run in by the top funnel and tube so that it is delivered underneath the mother. If on top it will spoil the mother and the fermentation.

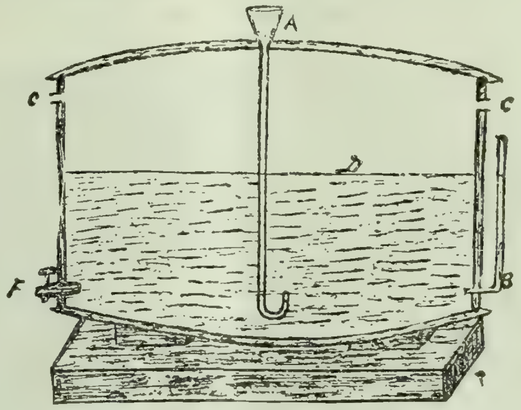


Fig. 2.—A, funnel and glass tubing by which juice enters under the "mother.". B, glass tube to show height of liquid in barrel. C, opening protected by cheese cloth. D, "mother" on surface of liquid. E, stand F, spigot.

This method makes a fine quality of vinegar and is of very little extra expense other than the greater attention demanded. The increased amount made in a given time offsets the added expense and labor.

The Care of Cider Vinegar

After the vinegar fermentation is complete a certain amount of care is needed, otherwise the fermentation will go further and the vinegar will be lost. Care must be taken, as at all times, to keep the vinegar free from dirt, flies and anything which would carry bacteria into it. It has been shown before that for the vinegar fermentation to proceed, a large amount of air is necessary; hence to stop it the first means is to exclude the air. When the vinegar is drawn from the barrel it can be bottled, barreled, or put in small kegs to suit the market. Whatever the container, it should be filled as full as possible and all bungs closed tightly.

Summary

Use only clean, sound apples. Use all cleanliness in obtaining the juice. Have clean and well scalded barrels, fill about one-half to three quarters full of juice. Cover bungs with cheese cloth to prevent entrance of flies and dirt. Keep barrels at 65 to 70° F. if rapid fermentation is desired; yeast added shortens period of fermentation. For vinegar fermentation add some old vinegar with mother and keep at a temperature of 65 to 75° F. Fill the containers as full as possible with the vinegar and cork tightly.—*Canadian Countryman.*

APPLE SIRUP

A Method of Utilizing Windfall and Cull Apples — Directions for Making This Palatable Product

EXPERIMENTS by Government canning specialists show that a very palatable apple sirup can easily be made from apple cider. While it may not be practical for the average fruit farmer to produce apple sirup on a commercial scale, the home manufacture of apple sirup for the family's winter use will furnish a profitable outlet for a large number of culls and windfalls which can not be marketed.

Apple sirup made by the following method is a very palatable product. It has a flavor much like the thick sirup or jelly which is so often formed when apples are baked with a little sugar. As shown by experiments, this apple sirup can be used in cooking with good results, as well as for table purposes.

Reducing Apple Cider to Sirup

Wash apples and remove all decayed and worm-eaten spots. Press out juice as usual for cider making. Be sure the juice does not ferment or "work," as only sweet cider should be used for sirup making. The sterilizing reducing vat or kettle should be a third larger than required to hold contents.

Add 5 ounces of powdered calcium carbonate to 14 gallons of apple cider. Powdered calcium carbonate (carbonate of lime), commonly called precipitated chalk, is a low-priced chemical available at any drug store. Boil in kettle or vat vigorously for a period of 5 minutes. Pour the liquid into vessels, preferably glass jars or pitchers; allow to stand 6 to 8 hours, or until perfectly clear. Pour the clear liquid into preserving kettle. Do not allow sediment at bottom to enter. Add to the clear liquid one level teaspoonful of calcium carbonate and stir thoroughly. The process is completed by boiling down rapidly to a clear liquid. Use density gauge or candy thermometer and bring it up to 220° F., or, without thermometer, reduce bulk to one-seventh of original volume. To see whether it is cooked sufficiently, test as you would sirup or candy, by pouring a little of it into cold water. If boiled enough, it should have the consistency of maple sirup. It should not be cooked until it hardens like candy when tested. When the test shows that the sirup has been cooked enough, pour it into fruit jars, pitchers, etc., and allow it to cool slowly. Slow cooling is important, as otherwise the suspended matter will not settle properly and the sirup will be cloudy.

A good way to insure slow cooling is to stand the vessels full of sirup in a bucket or a wash boiler of hot water. They may also be placed in a fireless cooker. The white sediment which settles out during cooling is called "malate of lime" and is a compound of lime with the natural acid of the apple. When the sirup is cooled, it should be stored in fruit jars or bottles. Place the rubber cap or cork in position and tighten. Then place the bottles or cans of sirup in hot water and sterilize for 12 minutes in hot-water or home-made outfit.—*Weekly News Letter, U. S. Dept. Agr.*

Note.—Through the courtesy of officials of the United States Department of Agriculture, I have had the privilege of examining sample of sirup made by the above process in 1914. It tastes like the sirup which exudes from baked apples. The sediment, "malate of lime", is of the same composition as maple sugar sand and may be marketted for the same uses.—J. F. SNELL, Macdonald College.

PLANTING BULBS

Directions for Planting Tulip and Narcissus Bulbs—Cultivation and Treatment

If you would have rich beds of tulips or give the beds or the corners of your lawns a beautiful springlike yellow or white glow of narcissus, daffodil, and jonquil, you must begin to think of the early spring appearance of your garden in the fall, for the bulbs of these flowers must be planted in the fall before the ground is frozen. In fact, this work should be undertaken as soon as or before an early frost has begun to make the annual flowers in the beds look weakened. In dealing with narcissus, which is the family to which the daffodil and jonquil belong, it might be well to think of trying to naturalize the narcissus to grow and blossom on the lawn much as do the wild flowers. How to plant and handle the bulbs, as well as the best method of getting them to become spring residents of grassy corners, are described in the following directions issued by the bulb specialists of the department.

These bulbs should be planted in light, rich soil that has been dug to a depth of at least 10 inches. The tulip bulbs should be set 5 inches apart and 4 inches deep and the narcissus bulbs about 10 inches apart and 5 inches deep.

If they are to be grown in pots or window boxes, light, rich soil should be used. Place 1 to 2 inches of cinders or broken pots in the bottoms of the pots or boxes to insure good drainage. After planting, place the pots or boxes out of doors and cover them with about 4 inches of ashes or sand; or they may be placed in a dark, cool room or cellar for a few weeks until the bulbs have formed a quantity of roots. They may then be brought into the light and heat for flowering. Keep the soil well moistened from time of planting, but avoid overmoistening, for if kept too wet the bulbs will decay.

Cultivation

If planted in beds, the surface of the soil should be loosened after each rain and the bed kept free from weeds. In the late fall or early winter months, it is well to cover the beds with a light mulch of straw or leaves to prevent injury to the young roots from the alternate freezing and thawing of the soil. This mulch should be gradually removed in spring, as soon as growth appears above ground. The bulbs are quite hardy and are not injured by severe cold if the soil is well drained.

Lifting and Dividing

Tulip and narcissus plants are perennial, and if given proper care and grown under suitable soil and climatic conditions will increase and multiply from year to year. The bulbs may remain in the ground two or three years, or until the clumps begin to crowd. After blossoming in the spring, from six to eight weeks should elapse to allow the foliage to die partially down, when the bulbs may be lifted with a spade or fork. Shake the soil from the roots and store the bulbs in a cool, shady place where they will ripen and cure. When the old leaves and roots are thoroughly dry they may be easily rubbed off and the clusters of bulbs divided. The bulbs may then be planted in the same manner as the original bulbs. In this way the stock may be increased in a few years.

Naturalizing the Narcissus

The narcissus often becomes naturalized when planted in the sod or partial shade, where it will continue to grow, blossom, and multiply for many years without further attention. Simply make a small hole in the soil 5 or 6 inches deep, insert the bulb pointed end up, press the soil over the top, and nature will do the rest. For naturalizing, avoid planting in rows or rigid geometrical figures. A good plan is to scatter the bulbs like seed and plant where they fall. This method of planting is extensively followed in the home grounds and parks of England and other countries in Europe. In portions of North Carolina, on large estates along the James River in Virginia, and in old gardens in New England narcissuses that were planted over half a century ago are still growing vigorously and every spring produce beautiful displays of blossoms.-*Weekly News Letter, U. S. Dept. Agr.*

NO ESCAPE.—Hotel Clerk—"The guest in No. 206 says he had a nightmare last night".

Proprietor—"Well, charge it on his bill—ten dollars for livery".—*Judge.*

THE FARM AND FARM CROPS

SHERBROOKE EXHIBITION

The annual fall holiday week for the Eastern Townships as staged in the great Eastern Exhibition at Sherbrooke, Sept. 4th to 11th, is over. Thousands have gone home happy, more convinced than ever that the Sherbrooke fair is worth waiting for and that it grows in attractiveness year by year.

On the principal days of the fair the crowds were limited apparently only by the capacity of the grounds. They came in automobiles, carriages, by the street cars and on foot and taxed the capacity of the grand stand, the midway, the stables and other buildings. The crowd reflected the season that the Eastern townships have enjoyed. Providence has been kind and has seldom furnished better crop conditions than in 1915. So every one was happy and prosperous looking, bent on getting the maximum of enjoyment out of the holiday. The extreme heat and the dust probably contributed little to the pleasure of the holiday seekers, but all agreed that the best fair weather was hot weather and that dust was a necessary evil.

Some improvements have been made since last year in the entrances so that we can now get inside without being run down by a motor car, all automobiles entering by the gate opposite the hospital. There is still room for improvement in the street car service. With the limited number of cars available people cannot hope to be moved citywards as rapidly as they wish between five and seven, but some effort should be made to limit the number allowed on the platform at the exit from the grounds and to prevent people hanging in the inside of the cars. That there were no serious accidents was not due to the vigilance of either the street car officials or the Exhibition authorrities.

Space everywhere was at a premium. Manufactured products as usual occupied most of the main building, but there were also very attractive displays by the Quebec Central Railway, Grand Trunk and Canadian Pacific. The Experimental Farm at Lennoxville also had an attractive and highly educational display. Considering the short time that this farm has been in operation the farm products exhibited were most excellent. The charts and models displayed were well conceived and attractively staged. The attendants, Mr. Ritchie and Mr. St. Marie, were most attentive to the enquiring visitor.

The poultry display was the best by far that has been seen at Sherbrooke. With over four thousand birds on display one can understand that the crowing was not confined to the cocks but was indulged in by the directors in charge. An additional wing will be required next year if there is any further increase in entries.

Considering the importance of the dairy industry in Quebec one would have expected to see a larger exhibit of butter and cheese. The creamery men of this province seem to devote more attention to exhibits at Toronto and Ottawa than to their home exhibitions, as a good share of the premiums at the big Ontario fairs usually find their way to Quebec. What few exhibits there were, were highly commended by the judge, Mr. C. H. Barr of the Dairy Commissioners Branch. We hope to see next year the beginning of a revival in the dairy display.

The show of fruit was smaller than in some other years but this was entirely due to the fact that all the fruit entered by several of the largest exhibitors went astray and arrived late. The outside visitor would be likely therefore to get a mistaken impression of the importance of the fruit industry in Quebec. The apples on exhibit were of good size and well colored for such a dull season. They did not show to advantage, however, on account of lack of light.

There was a very slim showing in the classes for agricultural products—grain, seeds, roots and corn. In fact the less said about this feature of the show the better. There were only half a dozen samples of oats shown. Of these five were candidates for sixth place. There were four of wheat, four of barley, two of corn, one flax, one timothy, two clover and so on, practically no competition and much of the stuff shown was of poor quality. There was so little that it was impossible to have it displayed to advantage and most of these who saw it must have concluded that Quebec produced very little grain and that of poor quality. Most of the trouble would appear to be that this is the wrong time of year at which to show grain. Comparatively few people have threshed and most of these who show probably thresh out a few sheaves and take the grain to the fair rather than let the prizes money go begging. It would appear the wiser plan to eliminate the classes for threshed grain and seeds and to add the prize money to that of the seed fair held at Lennoxville in the winter, or to some other department of the exhibition. Better no grain show at all than a show like that of this year.

The vegetables shown merited better treatment than they got. On wide low flat tables they showed to poor advantage but were on the whole of excellent quality. The results of the judging would probably be disappointing to those who brought out their products of largest size as a premium was put on quality rather than size. It would appear advisable to put in classes for cabbage and pumpkins in the class for field crops and thus afford a suitable place to show the mammoth productions of some of the Sherbrooke market gardeners.

Among the special exhibits, those of the Provincial Govrenment and Macdonald College deserve special mention. The Provincial Government had the right wing of the transportation building beautifully decorated in white and green. The central feature was a pyramid of Duchess apples, twelve feet at the base and ten feet high. In one corner there was an appetizing display of hams and bacon from one of the government factories and at the right of the entrance Father Leopold had a beautifully arranged exhibit of injurious insects and fungus diseases. Throughout the fair he was on hand to give advice to those inquiring the about various features of the exhibit.

The Macdonald College exhibit occupied the opposite wing of the same building. The central feature was a display of products of the Horticultural Department showing the best varieties of fruits and vegetables all named and tastefully staged. The famous Montreal Melons were conspicuous and many envious glances were cast toward them. The poultry department was in charge of Andy Taylor, '15, and he busied himself disseminating information on types of birds, methods of feeding, trap-nesting and a hundred other topics that only a poultry man knows about. The Biology department had a comprehensive display of injurious and beneficial insects, fungus diseases and weeds and a courteous attendant in Mr. DuPorte to answer inquiries from interested spectators.

In the Agricultural Engineering department model of a plank frame barn attracted a great deal of attention and every spectator had his own way of pulling it to pieces and rebuilding it to better suit his tastes.

The Cereal Husbandry Department had facts and figures displayed for those interested in alfalfa, grains, corn, roots, etc. Samples in the sheaf and threshed of this year's crop of all the leading grains were shown and among these, few were more admired than several sheaves of fall rye. This crop has on an average of six years grown a higher yield of grain per acre than any other cereal crop grown. Charts showed the advantages of early seeding, the average yield of various varieties of oats, barley and wheat, essentials in alfalfa production, etc, all the results of experiments conducted at the College.

The whole college exhibit was tastefully arranged, and College colors, green and gold, were used as decorations. Signs in black and white were used to good effect to bring important information to the notice of visitors. Enlarged photographs were also used to good effect.

A report of the fair would be incomplete without mention of the one feature for which so many people go—viz, the attractions. No single feature was so hair-raising as the motorcycle races. All the spectators seemed glad they were not on the motor cycles and as the riders seemed happy where they were everyone was content. The daily balloon ascent was of just as great interest as though it had been the first one that had ever been seen by the spectators. The Midway afforded the same old wonderful sights,—the white steer, the fat woman, the two-headed calf, the dancing girls, the wheels of fortune, the same vivid descriptions of the wonders by brass-throated heralds and the same old gullible public. But since we all go to the fair either to be amused or to be fooled why find fault with it? Fair attendants are primarily holiday makers. So the Midway and the platform attractions came in for their share of patronage. Only those who had been properly fooled with a few of the offerings fully appreciated that they had been at the fair.

J. M.

AGRICULTURAL CONDITIONS IN RICHMOND COUNTY

It would be difficult to find, and no less difficult to imagine, a fairer prospect than is presented to the eye of one who stands upon one of the heights of Richmond County in mid-summer. The gently sloping hills, verdant with pastures and unripened grain, the fertile valleys with their well-kept towns, the winding roads, the mountain tops in the distance combine to produce an effect that gratifies both the sight and the imagination. Frequently on the hill tops the road runs over bare rock. In some places the rock is slaty, and commercial slate is quarried at Bromptonville. Occasionally quartz is to be seen and sandy spots are not uncommon. The village of Asbestos, according to the census the second largest urban municipality of the combined counties of Richmond and Wolfe, takes its name from the important mines of serpentine asbestos whose operation is the chief occupation of its inhabitants. Windsor Mills, Richmond and Danville have manufacturing interests in addition to their ministrations to the surrounding farms.

Population

The combined counties of Richmond and Wolfe had in 1911 a population of 39,491 of which considerably over one-third (14,115) was urban and four-fifths was of French origin. The urban population had increased by 5338 in the preceding decade, while the rural population showed an increase of only 16. Richmond, taken alone, would no doubt show a larger proportion of urban population than the combined counties, since the three towns of Richmond, Windsor Mills and Bromptonville and the two large villages of Asbestos and Danville lie within the borders of that county. Richmond and Wolfe are less densely populated than Missisquoi and Shefford. Including the towns, they are more densely settled than Brome but the number of people per square mile in the rural districts is probably not much, if any, greater than in the most sparsely populated of the three counties of Bedford District.

Farms and Live Stock

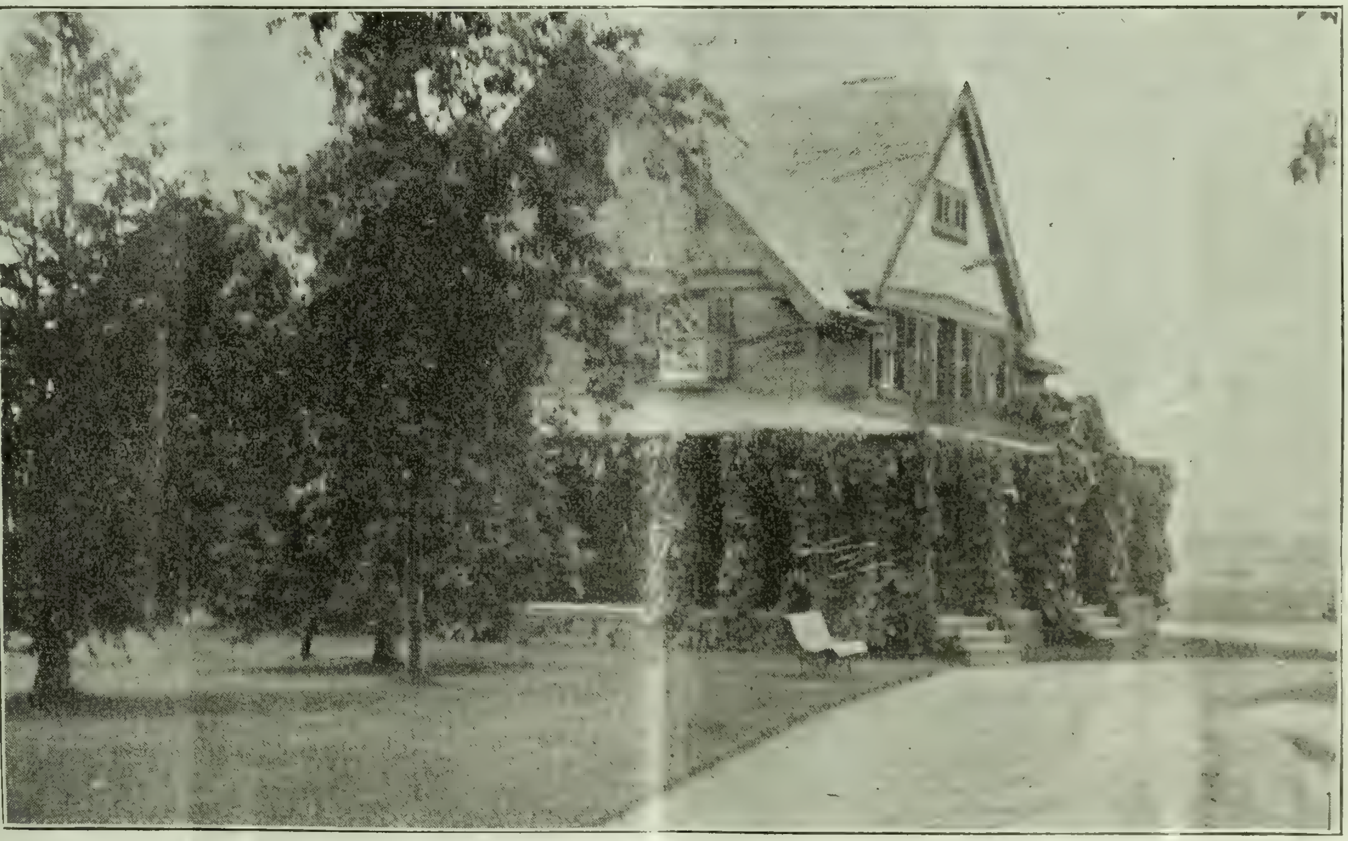
In the census year Richmond had 856 farms of 51 to 100 acres, 597 of 100 to 200 acres and 121 of over 200 acres area. Of the 220 thousand acres occupied no less than 208 thousand were owned by the occupants. The rented and leased farms therefore amounted to less than six per cent. of the total. Less than half of the 220 thousand acres of occupied land was improved. Richmond had at that time over 5,800 horses and over 26,000 cattle, of which about one-half were milch cows. Of the horses only 79 were pure-bred and of the cattle only 442. Out of a total of 7,200 sheep but little over the odd 200 were purebred and out of 9400 pigs only 100 were of the purebred sorts. Small as these proportions appear, they are for the horses much better than, for the cattle fully equal to, and for the sheep nearly as good as, the corresponding figures for the Bedford district and in all three far above the average for the province. Thus:

NUMBER OF PUREBRED ANIMALS IN EVERY 10,000

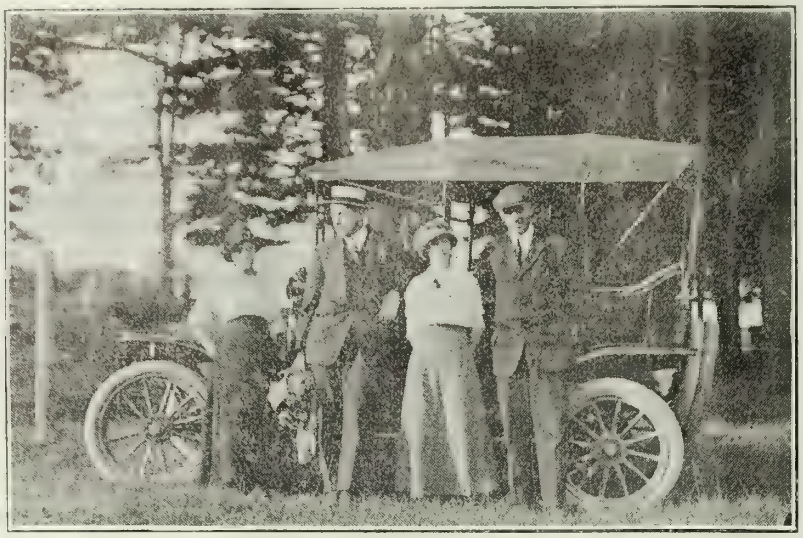
	Bedford District	*Richmond County*	*Province of Quebec*
Horses	55	136	94
Cattle . . .	177	179	125
Sheep . . .	314	294	96
Swine . . .	180	108	104

Agricultural Production

The value of the field crops produced in Richmond in 1910 was estimated by the census officials



"Isaleigh Grange", Danville, P. Q. The country residence of J. N. Greenshields, Esq., K.C. of Montreal.



Mr. C. H. Hodge, Demonstrator, and Mr. T. H. Biggar, Assistant-Demonstrator, Macdonald College, Extension Branch, Richmond, P.Q. The ladies are Mrs. Hodge and her sister.

to be obout $900,000; that of the milk produced, $425,000; that of the farm animals sold and slaughtered, $335,000. The poultry industry produced over $68,000, and the maple sugar industry over $25,000. The total annual production of the farms of the county approaches the two million dollar mark.

Organizations

In addition to the Richmond County Agricultural Society which holds its fair at the county seat (Sept. 16-17 this year) there is an independent association, "The Danville Union Agricultural Association", holding an annual exhibition at Danville. The county has a considerable number of Farmers' Clubs, of which at least four are composed of English-speaking farmers. Some of these clubs own bulls, others pay premiums on registered, purebred sires. Some of the clubs handle seeds. Two of them own spraying outfits. All, of course, hold meetings for the discussion of matters of common interest. Danville has a Cheese Board which provides market facilities for a very considerable quantity of cheese during the summer months.

Macdonald College has an extension branch in Richmond with Mr. C. H. Hodge as Demonstrator and Mr. T. H. Biggar as Assistant Demonstrator. The farmers of the county show genuine appreciation of the services of the Demonstrators. There are frequent calls for them to identify weeds and insects and to diagnose plant diseases. Not only do the farmers show appreciation of the Demonstrators by using them, but the County Council contributes liberally to the expenses of the Branch. Mr. Hodge has visited all the Protestant rural schools of the county and has organized school fairs at Richmond and Danville. He also assisted in the organization of the Richmond County Wool-Growers' and Sheepbreeders' Association. This association, formed last winter, has already done its members good service in securing better prices for wool than could have been obtained by them individually.

J. F. S.

PLOUGHING AND PLOUGHING MATCHES

By S. E. Greenway, University of Saskatchewan

The Purpose of the Ploughing Match

THE object of the ploughing match is to encourage good ploughing on the part of the young men. Good ploughing is the fundamental operation in agriculture and the very basis of good farming. All really successful farmers are good ploughmen. The craftsmanship that is inseparable from good ploughing manifests itself in every manual act of the farmer. It has been observed that the best ploughmen in the community are not only the best farmers but, generally speaking, the best and most influential citizens.

Characteristics of Good Ploughing

Good ploughing consists of:

(1) A correct strikeout which is secured by making the first furrow comparatively shallow and "hawing" around for the second furrow. This is to insure a clean operation. The ploughman then "gees" around, throwing back the second and strikeout furrows with a clean undercut in each case, and filling the dead furrow evenly. The plough is then gradually let down to the proper depth in the first three or four rounds. The result will be a uniform and ridgeless "crown or feering". Some careful ploughmen leave an unploughed strip about four inches in width between the strikeout and second furrow made by "hawing" around, which is skimmered with the point of the plough before filling in the dead furrow. This is doubtful economy.

(2) Straightness: Economy of energy is not possible with careless ploughing. Straightness of furrow permits uniformity of collar pressure on the horses; the saving of time by useless twisting and turning; overcomes the danger of weeds left to grow; and demands the nicety of mechanical adjustment which gives ease and pleasure to every part of the operation.

(3) Proper "ins and outs" at ends: The ends of the ploughed land should be straight across. There should be no land left unploughed and no soil should be carried from ploughed land to head land.

(4) The furrow should be of uniform depth and width. The furrow slice should be clean cut in order that all roots be severed and the slice completely inverted.

(5) The "finish" should leave all the land in the field ploughed, the last furrow being uniform in width, and the dead furrow the depth of the ordinary ploughing. The dead furrow should not be lifted until the judge has examined the ploughing.

(6) Evenness of top of land: Uniformity of the surface of ploughed land secures uniformity of crop other conditions being uniform. This feature is largely valuable from an aesthetic standpoint but is nevertheless economically necessary, as it influences yield and wear and tear on implements.

(7) Covering weeds and stubble: This is the most important economic feature of good ploughing. Weeds and stubble properly buried give less trouble in cultivation, are more likely to be killed and replenish organic matter. The covering of weeds is essential if the soil is to be kept clean.

Advantages of Good Ploughing

Good ploughing is essential to:

(1) A good seed bed. It is as economically wise to prepare a good home for field crops as faithfully as for garden or orchard crops. The "fourfold" treasure of the vineyard is an eternal verity.

(2) Weed destruction is not possible with careless ploughing. Good ploughing destroys annual, biennial and perennial weeds and grasses.

(3) Good ploughing ensures the maximum of mechanical ease with the minimum of labour. It is the line of least resistance to the ripened fields.

(4) Good ploughing is ploughing done at the right time. Generally speaking, ploughing other than summerfallow should be done when the soil is in the best physical condition.

(5) Good ploughing depends on a good plough. This must be sharp and cut clear and free. A badly adjusted plough with a dull share adds largely to the cost of production.

(6) Good ploughing promotes self respect. It is the testimony of many good judges that encouragement in the craftsmanship of ploughing has elevated many young competitors above the level of their environment. If there were no other arguments in favor of skilled effort this would suffice. —*The Agricultural Gazette.*

SEED GROWING CENTRES IN QUEBEC

By L. H. Newman, Secretary Canadian Seed Growers' Association

DURING the past ten years special efforts have been put forth throughout Canada to increase the production and to facilitate the distribution of high class seed of our ordinary farm crops. To this end the Canadian Seed Growers' Association was organized in 1904, with head-quarters at Ottawa. Until recently the membership of this association was made up of individual farmers, each of whom was required to operate what is known as a *"Hand-selected seed plot"* each year, and to select from this plot twenty-five to thirty pounds of typical heads, pods, ears or tubers, as the case might be, and with the cleaned seed obtained to sow a similar plot the following year.

After several years' experience, it was found that the number of farmers who would take this care in improving and maintaining the purity of their seed stocks was comparatively small, with the result that the amount of seed originating from these special selections was much below the demand. In order to increase this supply the Seed Centre idea was launched in 1913.

By this system suitable districts are located for the production of a given kind of seed, and a number of farmers are then encouraged to adopt a certain variety and to grow it according to a prescribed system, so that their product may be officially recognized as "registered seed." Instead of each of these men having to operate a seed plot, they choose one of their number to do this, agreeing to pay him a certain price for a small supply of so-called "Elite Stock Seed" for multiplication next spring.

This means that these growers, with the exception of the special selector, are simply propagators of high class seed grown under special supervision, their work being inspected each year during the growing season and the seed they are offering for sale examined later. The following statement indicates the progress that has been made in Quebec during the past few years in the organization of these centres:—

Name of Centre and Address	*Variety*	*Members*
Bagot County Banner Oat Centre	Banner oats	16
Acton Vale (Bagot Co.) Banner Oat Centre	Banner oats	6
Champlain County Banner Oat Centre	Banner oats	7
Cookshire Banner Oat Centre (Compton Co.)	Banner oats	13
Dunham Banner Oats Centre (Missisquoi Co.)	Banner oats	6
Hartley Banner Oat Seed Centre (Stanstead Co.)	Banner oats	14
Hillhurst Banner Oat Centre (Compton Co.)	Banner oats	3
Lennoxville Banner Oat Centre (Sherbrooke Co.)	Banner oats	18
Lorette Centre, Banner Oats (Quebec Co.)	Banner oats	7
Stanbridge E. Banner Oat Centre (Missisquoi Co.)	Banner oats	3
St. Anselme Banner Oat Centre (Dorchester Co.)	Banner oats	10
St. Bernard Banner Oat Centre (Dorchester Co.)	Banner oats	6
Ste. Eulalie Banner Oat Centre (Nicolet Co.)	Banner oats	4
Ste. Monique Banner Oat Centre (Nicolet Co.)	Banner oats	6
St. Felecien Daubeney Oat Centre (Lac St. Jean Co)	Daubeney oats	5
St. Felecien Banner Oat Centre (Lac St. Jean Co.)	Banner oats	11
St. Norbert Banner Oat Centre (Berthier Co.)	Banner oats	7
St. Prime Banner Oat Centre (Lac St. Jean Co.)	Banner oats	11
Rimouski Banner Oat Centre (Rimouski Co.)	Banner oats	14
Shawville Banner Oat Centre (Pontiac Co.)	Banner oats	13

The names of the individual growers of the centres do not appear in the membership list of the association, but rather the name of the centre. The relationship of the Seed Centre towards the association and towards the Department of Agriculture is essentially the same as that existing between the individual members and these institutions.

The directors of the associations, consisting as they do of representatives from the different provinces, have agreed that the principle of local initiative and local responsability must be recognized in connection with the operations of these bodies. To this end provincial representatives have assumed the responsibility of organizing and supervising all centres. The fact that there are now so many districts represented by experts from the provincial departments of agriculture has made it comparatively easy to introduce and carry out this policy. The results to date on the whole are most encouraging, and those closely associated with the movement look forward to seeing the whole seed question revolutionized. By means of this system buyers will be able to purchase in car-load lots and directly from growers if they so desire. This should make it possible for every farmer who has to buy seed to obtain seed of a known variety which is true to name, of high vitality and free from weed seeds. To seed of this class the term "registered seed" has been applied, and farmers are gradually coming to understand that this class of seed is not beyond their reach.

LIVE STOCK

LIVE STOCK AT CANADA'S GREAT EASTERN EXHIBITION, 1915

EXCELLENT preparation is always made at the Sherbrooke fair for the Live Stock exhibit. It certainly attracts the most attention of all the departments of the fair and is without doubt the outstanding feature of the whole show. The many well contested classes of stock especially interest the exhibitors and farmers, and the cattle and horse parade, which takes place each afternoon succeeding the judging, is a sight of vast interest to all present, whether directly or only indirectly connected with stock.

BEEF CATTLE.

Sherbrooke, quite frequently referred to as the centre of the Eastern Townships, is the centre of a territory in which much interest is directed to beef production and consequently one would naturally expect to find keen competition in the breef cattle classes. In this respect any one attending the exhibition would not be disappointed. Shorthorns unquestionably present the most competition in their various classes but each year sees the white-faced breed, the Hereford, gaining in display. A. Hunter of Orangeville, Ont., and A. E. Alger of Eaten, Que. made a very creditable Hereford exhibit, contesting each other in every possible class. The Hunter herd, however, fared somewhat the better. Mr. Alger's two-year-old heifer won the senior female championship, but she had to make way for Hunter's yearling when showing for female any age. In the Shorthorn section one would find considerably more entries, and many excellent animals and classes appeared before the judge. F. M. Cromwell, M. P., Cookshire, Que. appeared with a bunch of animals in excellent show condition, which had no difficulty in obtaining many of the first prizes and all of the championships, Junior, Senior and Grand, in both the male and female sections. This, however, casts no reflection whatever on the remaining animals, because in most of the classes many excellent individuals had to be content with only a place.

The Shorthorns of more milky nature, commonly called "dual purpose Shorthorns", are at this exhibition entered in a distinctly separate section from the regular Shorthorn classes, and many large deep-milking cows appear in this section. J. H. M. Parker is amongst the strongest contributor, winning in both the aged bull and cow class. In general he, together with many other local men, made a good showing in the remaining classes. The Galloway has not yet found its way to Sherbrooke but each year sees one or two Aberdeen Angus exhibitors present. Of the three herds exhibited this year J. A. McLeod, Plainsville, Que. had very little difficulty in holding his own.

DAIRY CATTLE.

No doubt fewer strictly local exhibitors appear in the dairy cattle classes than in the beef classes. Nevertheless one always sees a good dairy cattle show at Sherbrooke. The Ayrshires have always been, and are yet, well to the fore with their exhibit. Both the Jerseys and Holsteins, however these past few years have made wonderful strides as regards both quantity and quality, the Holsteins this year outnumbering slightly either of the other breeds. The Holstein classes from start to finish were keenly contested by Mr. McPhee, Vankleek Hill, Ont. and Harding Bros., Welsford, N. B., while J. J. Alexander, St. Louis, Que., J. L. Riches, Sherbrooke, Que. and W. Clarke, Waterville, Que. made strong competition in some classes. Alexander won the aged bull class, McPhee was second and Harding Bros. were third. Harding Bros. were alone in the two-year-old class with a bull which afterwards won Senior Championship. The yearling class brought out a sensational winner, W. Clarke's "Wilfred DeKol Lad", afterwards Grand Championship male. The aged cow class appeared with twenty entries some of them in poor condition. However the prize winners were an excellent bunch of cows. McPhee's "Lady Jane of Burnbrae" was first and Grand Championship cow, Harding Bros. second and McPhee third again. The junior female championship was won by Harding Bros. In the Senior Herd McPhee was first, Harding Bros. second and Riches third. In the Junior Herd Harding Bros. first, McPhee second and Riches third.

The Ayrshire exhibits by G. H. Montgomery, Phillipsburg, D. T. Ness, Howick, J. W. Logan, Howick, A. Phaneuf, St. Norbert, and J. Ste. Marie, Compton—all Quebec men—were brought out in excellent condition. Montgomery's aged bull, "Auchenbrain Seafoam", was first and champion. Ste. Marie's "Vaudreuil Pioneer" was second in the aged class. Ness won the yearling bull class with an animal which was afterwards given junior male championship. In a strong class of aged cows Ness's "Buchan Jean" cow was first, Logan's "Ardyne" cow second, Ness third, Montgomery fourth and Phaneuf fifth. In the younger classes Ness, Logan and Montgomery won most of the prizes. Senior and Grand Championship female went to Ness on his aged cow and Junior championship female went to Montgomery. In the aged herd Ness was first, Montgomery second, Logan third and Phaneuf fourth. In the young herd, first Ness, second Logan and third Montgomery.

The Jerseys made a strong showing, perhaps stronger than was ever before at Sherbrooke. It would seem that the Jersey men possessed the show ring spirit because the animals were all brought out in good show form, which under ordinary circumstances is a large share of the battle in such work. The Ruiter herd from Cowansville is perhaps the strongest. Other exhibitors who were well in the prize money are Alexander from Coaticook, Edwards from Hillhurst and Martin from Warders—all Quebec exhibitors.

In Guernseys Guy Carr had his usual string of animals on exhibition and in French Canadians A. Denis, Jos. Coulombe and Sylvester Bros. were the main contributors. Several local men interested in Brown Swiss cattle usually put up a good exhibit and they were out as strong as ever this season.

SHEEP.

Sheep raising in the Province of Quebec is gaining materially in importance and by reason of this numerous Ontario breeders are exhibiting at our shows. Their contributions together with the turnout of the Quebec breeders made a fine display of the wooled animals in almost all breeds. Keen interest was taken in the Cotswold classes between Thos. Allan, New Castle, Ont. and A. Denis, St. Norbert, Que. Other Cotswold exhibitors were W. Glassbell, London, Ont. and Jas. Campbell, Parkhill, Ont. Well-filled Leicester classes appeared before the judge with many good local exhibits, H. & W. Allan of New Castle, Ont. however had things very much in their favour. A. Ayre, Bowmanville, Ont. and H. Elliot, Danville, Que. were the greatest competitors in the Southdown classes. A very strong and uniform showing was made in Hampshires by Lyster Bros., Kirkdale, and J. Oughtred, Marbleton, Que. In Oxfords A. McIntyre of Parkhill, Ont. made a good exhibit with Sylvester and Denis as his competitors.

In the midst of the sheep pens was a small but attractive exhibit put up by the Animal Husbandry Department of Macdonald College. The exhibit consisted of a pen of ewes, a pen of yearlings and a pen of lambs of both the Southdown and Cheviots breeds of sheep. Above the pens appeared some model structures relating to the sheep industry,—a feeding rack, a dipping tank and a sheep horse together with printed charts explaining these particular structures. The fit and condition of the sheep and the various models attracted a great deal of attention.

SWINE.

The swine entries were not as numerous as one frequently sees at Sherbrooke, nevertheless some excellent bacon classes were shown. Tamworths and Yorkshires made a good showing. Chesters and Berkshires also were fairly well represented. McCulloch Bros., Sylvester Bros., W. M. Miller, J. Parnell, E. E. Ruiter and Mr. Nichols figured amongst the exhibitors.

HORSES.

In the numerous horse sections particularly the draught sections and especially in the Clydesdales, Percherons and Belgians many strong classes were shown. The turnout, not in small numbers but in large numbers, of Canadian-bred Clydesdales and Canadian-bred animals in the draught sections, was remarkable to say the least. This ought to be encouraging to our Canadian breeders, especially in view of the slackness in importations this past season. Some of the exhibitors in the Clydesdale and other draught classes were R. Ness & Son, Howick, W. Nussey, Howick, S. M. McGerrigle, Ormstown, T. B. Macaulay, Hudson Heights, Jas. Haslett, Richmond, G. H. Montgomery, Phillipsburg, Brompton Pulp Co., W. Stocker, J. W. Logan & H. Kerr, Howick. In the aged Imp. class Ness and Son's big "Sir Spencer" was first. The Lennoxville Syndicate "Silver Cup" horse was second, Jas. Haslett third and Mr. Nutbrown fourth. In the three-year-olds Ness was alone, and in the two-year-olds Ness first with Macaulay second. Nussey was first in yearlings, McGerrigle second, and Stocker third. In the mares in foal Macaulay was first, McGerrigle second and third, and W. Stocker fourth. "Sir Spencer" won the Stallion any age and his daughter "Lady McTaggart" won the mare any age.

In the Canadian-bred Wm. Nussey's "Baron Silloth" horse was first, Montgomery's "Sir Spencer" horse second and J. E. Arnold third. Two-year-olds, first McGerrigle, second Macaulay. Yearlings, Nussey first. In the mare in foal class McGerrigle was first, McCormick second, Brompton Pulp Co. third, and in foals McCormick was first, McGerrigle second and the Pulp Co. third. In the remaining Canadian-bred registered classes and the draught classes Messrs. McCormick, Nussey, McGerrigle, Stocker, Donaldson, Lyster Bros., Macaulay, H. Kerr, Greig, the Brompton Pulp Co. and J. W. Logan were all prominent amongst the prize getters.

The aged Percheron class was a strong class including some eight or nine entries. Milton Porter, Simcoe, Ont., won first, J. E. Arnold, Lachute, Que. second, Porter's horse third, Mercier fourth and Arnold fifth. Mr. Aslet's three-year-old horse won his class. Smiley's two large mares won first and second, while Arnold won most of the younger mare classes. Smiley's first prize mare won the mare any age and Porter's first prize aged horse won stallion any age. Messrs. Sharland, Mercier, Standish, Aslet, Papineau and Gingras were other exhibitors in the Percheron section.

The Belgium breed put up a good showing. Many big strong horses came out. Arnold's quality horse won grand championship.

Frequently the local light horse men make a very creditable showing before the grand stand, and although some of the light classes were not as well filled this year as usual many good roadster classes appeared. In the high-stepping classes Miss Viau of Montreal made an excellent turnout and in the Hackney section T. B. Macaulay of Hudson Heights had a good exhibit.

A. R. N.

SOME FLOCKS, HERDS AND FARMS OF THE BEDFORD DISTRICT

II—A Holstein Friesian Herd that is coming to the Front

Mr. Percy W. Taber, East Farnham, P. Q.

MR. P. W. Taber, of East Farnham, is well-known as an enterprising young Holstein breeder. In the few years in which he has been in the business he has had good success.

He has in his herd Diploma 3rd. Belle, a cow that has given on an average for 7 days 102 lbs. per day, she being milked every 6 hours. This cow was bred by R. W. Walker of Utica, Ont.

A second cow, Car Born De Kol 2nd. bred by W. W. Brown, of Lyn, Ontario, is a grand cow of high producing qualities. She has given 98 lbs. milk per day and has also a butter record of 24 lbs. in 7 days, equal to 3½ lbs. per day, and now at the age of 13 is giving 80 lbs. of milk per day.

A third cow, Lyons Beauty Clothilde, bred by Stevens Bros., New York, has never been beaten in a show ring. She is an 18,000 lbs. cow in eleven months and freshening in the twelfth month. She has a four-year-old heifer in the same herd, known as Clothilde Johanna, which has milked 73 lbs. per day.

A fourth cow is Forest Queen Inferno, a granddaughter of Rhoda's Queen. As a three-year-old Forest milked 64 lbs. In Mr. Taber's herd also is Daisy De Kol, another heifer with 70 lbs. to her credit. There are several other promising young heifers of these grand cows which bid fair to equal their dams.

At the head of the herd is Blizzard Sir Posch, a yearling. When a calf he was first prize winner at Sherbrooke, Quebec, Fredericton, St. John and Moncton, as well as Junior Champion at the above places. Blizzaid, the dam of this young champion, is one of the greatest show cows that ever graced a show ring, being four years in succession champion female at Toronto.

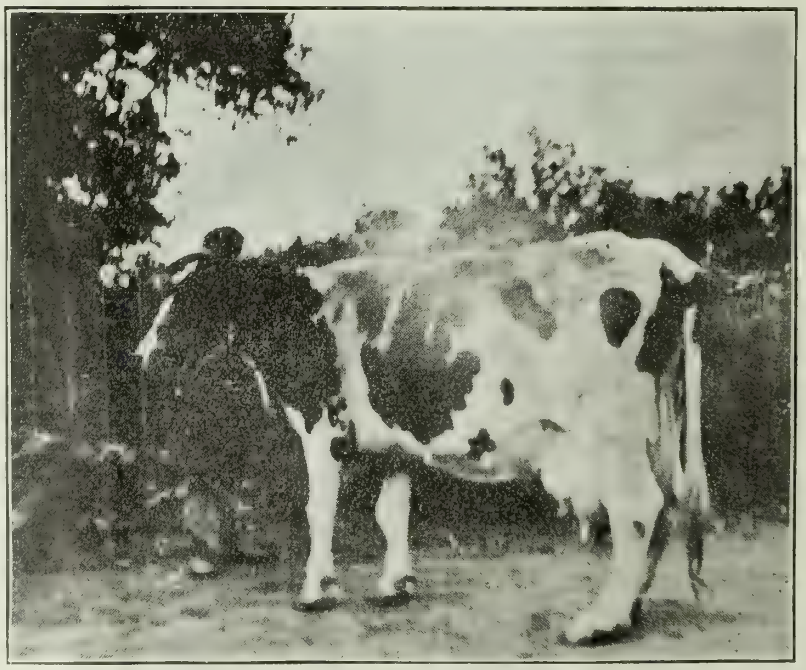
The sire of Blizzard Sir Posch in Schuiling Sir Posch twice Grand Champion at Toronto and sire of an 18-months-old heifer that in a public test away from home gave 57 lbs. per day for 7 days. This noted bull was also sire of Fremona 2nd. who at four years gave in 362 days 20,215 lbs. milk, 649 lbs. fat. Surely this looks promising as a foundation herd with which to do some good work.

Not only is Mr. Taber a successful breeder, but he is also a successful farmer and horseman. He has a Clydesdale brood mare, Rose Kandahar, that has won first in all her classes; also a Percheron brood mare with foal. Mr. Taber owned and fitted the famous Gelding Jerome, which won nine first prizes in 1914 and finished by taking the silver cup against prize winners in all classes at Sherbrooke.

His farm consists of 65 acres nicely situated in the village of East Farnham, with fine young orchard and up-to-date and modern buildings, equipped for, and shipping milk to Montreal. There were wintered on the farm 22 head of cattle and 4 horses. The principal feed for his cows is ensilage, roots, ground oats and clover.

At the time of our visit we found 9 acres of Wisconsin No. 7 ensilage corn which stood on an average 12 feet and well-eared, 4 acres roots and exceptionally fine crops, the barns full of well cured hay and clover and unthreshed oats. Mr. Taber says "Why feed this good feed to scrubs?" His motto is "Cull without mercy."

J. F. S.



Clothilde Joan de Kol.—A four-year old which has produced 13 lbs. milk per day. Property of Mr. Percy W. Taber, E. Farnham.

Blizzard Sir Posch. A yearling Holstein, owned by Mr. P. W. Taber, East Farnham.

DOES IT PAY TO FEED COWS AT GRASS ?

FARMERS are often advised to give additional food to their cows at grass with a view to maintaining or increasing the milk flow. This is no doubt advisable in certain cases, such as an abnormal season, and more so, perhaps, towards the end of it than earlier, and again on land which yields badly. It has been advised, too, on good authority, for specially deep milkers, but broadly speaking it seems to have been proved a wasteful and unnecessary proceeding.

One of the best authorities on feeding has forcibly pointed out that the good result of grass feeding is due to the larger amount of nourishment obtained as compared with winter feeding, also to the richer quality of the food, and not to a better utilization of it, and that an excessive rather than a diminished amount of protein is consumed. This being so, straw is advised when young clover or good grass is being consumed, and concentrated food only on poor land. Grass is a cereal, and may easily prove richer food than other grain, or at any rate as good, and better milk may result than under winter feeding in consequence.

NO DOUBT WHATEVER

There is no doubt whatever than much needless waste of food, so far as milk is concerned, is incurred in feeding cows. Experiments have fully substantiated this as regards summer feeding on grass. That a supplementary summer ration of 4—8 lbs. of cake and corn meal is exceedingly small as regards the yield of milk, provided the pasture is of average quality, has been plainly shown. Experiments go to show, too, that any small benefit is only observable towards the end of the season, owing to stale pasture and cold nights.

It has also been plainly shown that the cost of such food is out of all proportion to the increase of milk, especially as this only occurs towards the end of the season. Milk so made is, of course, much more costly to produce than grass-made milk, and the fact that this nearly double expense produced a much less profitable milk is significant.

A point to bear in mind here is the effect of lactation. As the summer advances so does the lactation period in the majority of cows, and it has been found that not even a check in the downward drop — except a temporary one — is effected by this extra food, let alone an increased flow. This is not altogether surprising, as careful investigations in lactation show that even grass, in the second half of the summer especially, has but little compensating effect against that of lactation. Nor does there seem to be any advantage gained in the matter of quality, as might be supposed from numberless experiments. It is well known that slight food changes produce only quite transitory changes as a rule in the milk supply (though drastic ones may adversely affect the milk in both ways) except, it would seem, with grains, which appear to prolong lactation to a considerable extent, and moreover to materially increase the flow, especially in the early stages of lactation without, however, appreciably diminishing the butter-fat.

THE MILK VARIATION

It is true that the richer milk which is associated with the late stages of lactation coincides more or less with a rich nourishing grass, but experiments do not even encourage cake, as it has been shown to be supplied at a loss. This is always provided that cows get enough food to keep them thriving, and it seems to be almost conclusively proved that it is not profitable to go beyond this either in summer or winter so far as milk is concerned.

Another important conclusion at which we arrive from experiments, and one which should appeal at once to the practical man, is the effect on live weight. Concentrated food given in the grass by no means necessarily implies a better carcase. It may even be the other way.

B.C.T.

KARAKUL SHEEP

An Asiatic Breed Producing Fur, Mutton and Cheese

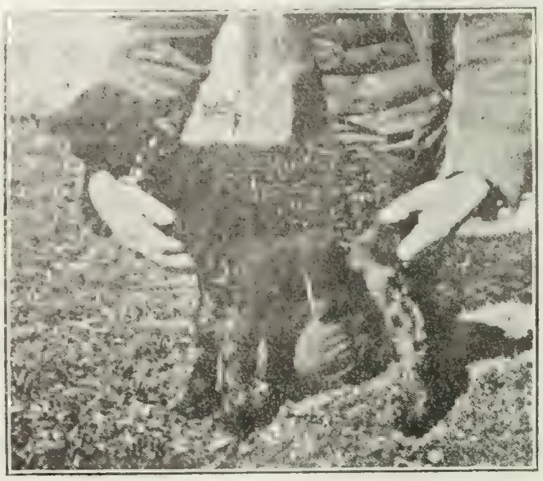
INTERESTING information has recently been published about the sheep which produce the fur misnamed "Persian lamb". Some of it is to be found in the Fifth Annual Report of the Commission of Conservation and some in an article by Professor Robert Wallace of the University of Edinburgh published in the Journal of the Board of Agriculture, August, 1915. In the Conservation Commission's Report the subject is treated by Mr. J. Walter Jones in an address on the "Progress of Fur-farming in Canada" and also by Dr. C. C. Young, the most prominent importer and breeder of these animals in North America. An excellent article on the subject by a Russian writer, M. Karpov, appears in the South African Agricultural Journal, Nov. 1913—Mar. 1914.

Karakul (the "u" is pronounced as in "full") is the name of a salt lake in Bokhara, a Russian vassal state in West Turkestan. The country about this lake is high, dry and in part so exceedingly barren as to be designated a desert. Developed under these trying climatic conditions the Karakul sheep are perhaps the hardiest of all domesticated animals.

Karakul-Duzbai Ram at the Farm of the Edinburgh and East of Scotland College of Agriculture.

Professor Wallace tells us that most of the sheep of Western Asia have sprung from two varieties known as the "fat-rump" and the "broad-tail" sheep and that the Karakuls originated in a cross between these two varieties in which the broad-tail characteristics have predominated. They have a tail with a tapering, twisted end and

THE TWO LEADING TYPES OF KARAKUL SHEEP.
Left: Shiraz Ram; Right: Duzbai Ram. Both purchased near Kara-Kum, Bokhara, and imported to Prince Edward Island.



Lamb from Karakul-Blackface cross, 2 days old, valued at $10.50.

a broad, flat, fatty base, sometimes weighing 15 to 20 lbs. in the full-grown ram and serving the same purpose as the hump of the camel in storing nutriment for days of famine. The jet-black, tight-curling, lustrous fur of the new-born lamb is the most valuable characteristic of the breed. It is this fur which constitutes the commercial "Persian lamb", and "Astrakhan", though "Bokharan" would be the correct geographical designation. As the curls rapidly lose character the lamb must be killed before it is ten days old and the best skins are obtained from lambs three to four days of age. Good skins are worth from $3.50 to $15.00 in New York. In Europe and America the skins are dyed to guard against possible loss of color. Skins with tight grey curls are rarer and higher-priced. These are known as "Shiraz". In the Crimea a fur with large, open grey curls is produced from a class of sheep supposed to be related to the Karakul. This fur is known as "Krimmer." The highest-priced fur of all is found in prematurely born Karakul lambs. This fur known to the trade as "Broadtail", is a fine, short, very glossy, velvet-like, straight hair with a beautifully figured water-mark. Although very beautiful, this fur is much inferior to "Persian lamb" in durability and wearing qualities.

The Karakul ewe is a heavy milker and will continue to produce for several months after the lamb is weaned. From 30 to 40 lbs. of cheese can be made from the milk of each ewe. This cheese, known as "Brinza" is greatly esteemed in Asiatic Russia. Karakul mutton is of excellent gamey quality free of the sheepy flavor characteristic of the full-grown Cotswold and to a less degree of other long-woolled British breeds.

Attempts have been made to colonize the Karakul breed in other parts of the world, including European Russia, Germany, German South-West Africa, Texas, Maryland, Prince Edward Island and Scotland. These enterprises have in several instances proved disappointing in so far as the quality of the fur is concerned, and according to Dr. Young, the most frequent cause of failure has been the difficulty of recognizing and obtaining the right type of foundation stock. Not only do both the Russian and the local Bokharan authorities discourage the exportation of Karakuls, but ignorant and avaricious breeding practices in the home of the breed have resulted in the admixture of Karakul blood with that of fine-woolled Asiatic sheep to such an extent that Dr. Young estimates that in the last ten years the average quality of Persian lamb skins has deteriorated by 85 per cent.

Karakul Ewe and Lamb in Prince Edward Island.

Encouraging results have been obtained in the crossing of Karakul rams upon long-woolled ewes of the British breeds, particularly upon Lincolns and Highland Blackfaces. Lambs of the proper type of fur are produced in the first cross. With finer-woolled ewes satisfactory results are not obtained in the first cross but may be if the crossing is continued. With the Barbados or woolless sheep, the United States Department of Agriculture, at the Exprimental Farm in Maryland obtained good skins in the second cross. Dr. Young is convinced that "there is absolutely no necessity for using full-blood Karakul sheep for the production of Persian lamb." The average Persian lamb skin from Bokhara, he assures us, does not contain over twenty-five per cent. of Karakul blood. "The proper system is to use the full-bloods to produce breeding animals and use grades to produce the furs."

HEAD OF KARAKUL-DUZBAI RAM.

Professor Wallace regards the prospects of a new meat industry as even more encouraging than the outlook for furs. "The carcasses of the ram lambs, which weigh from 8 lb. to 10 lb. each when 75 to 80 hours old, have proved to be a rare delicacy, which would doubtless soon become appreciated." Crossing with the other domestic breeds of sheep results in "a wonderful increase in weight, owing to the preponderance of fat-tail blood. Of the product of such crossing, the manager of the Armour Packing Company of Fortworth, Texas, writes, "Lambs are obtained which at the proper lamb age weigh 90 to 105 lbs. and have a most delicious flavour, as well as a heavy yield of mutton."

Those interested will find much more detailed information about these sheep in the publications mentioned above.

Those contemplating embarking in this line of breeding will do well to remember that it is still in a pioneering stage in America. The Karakul sheep has developed in an extremely dry climate and its adaptability to more moist conditions cannot yet be regarded as established. It should also be remembered that, although the average price of Persian lamb skins has nearly doubled in the last twenty years, it is still only in the neighborhood of five dollars and it is doubtful if the average skin produced in America is yet the equal of the average from Bokhara. The amount the prospective breeder can afford to invest in breeding stock must, of course, be governed by the prospect for profitable returns.

J. F. S.

BE PATIENT WITH THE FARM LABORER

The farm help question is a vital one. On the side of both the farmer and the hired man there are frequently seen grievous faults of manner and conduct. A most lamentable lack of human nature and ordinary business tact is very often at the bottom of help troubles. The remark a hired man recently made to us was very suggestive. He was speaking of his experience with a former employer and said:

"I expect and want to be spoken to whenever my way of doing work does not suit my boss. But I have a right to ask that he speak to me not as though he thought I was trying to do my work badly. The man I worked for last was a good man on general principles, but he had got into the habit of losing his temper with his children and his men when anything went wrong. He hardly ever took pains to instruct us how he wanted his work done. He thought we ought to know that to begin with, and if we didn't it made him mad. I think a farmer ought to train himself into the way of treating hired men as though they were human beings. Some men seem to lose their respect for a man the minute he commences to work for them. I could not stay with this man on account of his hasty temper.

"I think that most hired men want to please the man they work for and he ought to give them a fair chance to feel that way".

There is a good deal in that idea of giving a man a fair chance to feel well disposed towards his work.—*Hoard's Dairyman.*

AUCTION SALE

— OF —

200 SHEEP, 100 SWINE and 100 CATTLE

(Males and Females) All Pure Bred and Registered

ORGANIZED BY THE

GENERAL STOCK BREEDERS' ASSOCIATION

OF THE PROVINCE OF QUEBEC

UNDER THE PATRONAGE AND WITH THE FINANCIAL HELP OF THE

Hon. J. E. CARON, Minister of Agriculture of the Province of Quebec

AT MONTREAL

AT THE DELORIMIER PARK

At 10 A. M.

WEDNESDAY, 13th October, 1915

AT QUEBEC

On the Exhibition Ground, At 10 A. M.

WEDNESDAY, 20th OCTOBER, 1915

The animals offered for sale will be registered in the Canadian National Records. There will be some Canadian, Ayrshire and Holstein cattle; some Leicester, Cotswold, Lincoln, Shropshire, Hampshire and Oxford sheep and some Yorkshire, Berkshire, Chester and Tamworth swine.

CONDITIONS:—Cash, except to Farmers' Club and Agricultural Societies which will be allowed time on terms that will be given by the Department of Agriculture of Quebec.

Purchasers assume all responsibility from the moment the animals have been adjudged to them. For further particulars apply to:—

J. A. COUTURE, Secretary of Stock Breeders' Association

49 GARDEN STREET, QUEBEC.

THE DAIRY

QUEBEC BUTTER AGAIN VICTORIOUS

AT the Toronto Exhibition this year the Province of Quebec again carried off all the highest awards for butter. We copy the following report from the Family Herald and Weekly Star:

The butter and cheese classes at the Toronto exhibition have never been as well filled as this year. The quality of the entries was good, though the 21,450 pounds of cheese while uniform, scored a little below previous years. The butter exhibit, a third larger than last year and very fine throughout, comprised 6,246 pounds. The superior quality of the farm dairy butter was again very apparent.

In the class for creamery butter in salted solids (56 lbs. boxes), Joseph Dansereau, Vercheres. Que., carried off first prize with a score of 97.125, and the second, third and fourth prizes also went to Quebec. In the unsalted class, Quebec was again first, Achille Fournier of Gentilly, having 97.375 points. In this class a Manitoba exhibitor, M. Weir of Winnipeg, took third prize with 97 points.

For ten pound boxes of creamery butter the Canadian Milk Products Co., of Belmont, took first, with Adjutor Servaine of St. Hyacinthe, Que., a very close second.

The challenge trophy for the highest scoring creamery butter on exhibition was won by Achille Fournier of Gentilly, Que.

The special prize for the highest average score also went to Quebec, Clovis Lemay of St. Henedine, coming first, and the Canadian Milk Products Co. of Belmont, Ont., second with J. Allaire, St. Roche, L'Achigan, third.

In the cheese classes Ontario carried off the majority of the honors. Donald Menzies of Listowel, Ont., William Morse, Trowbridge, Ont,; Adhemard Gagne, Latimere, Que.; H. J. Neeb, Tavistock, Ont.; W. T. Oliver, Atwood, Ont., Henry Young, Listowel, Ont., and J. F. Cook, Gowanstown, Ont., were the winners of first prizes.

The silver cup for the highest score on factory cheese went to Henry J. Neeb of Tavistock, with a score ol 97.66. The same exhibitor also took the special for highest average score with 96.155 points. W. T. Oliver of Atwood being second and Wm. J. Morse of Trowbridge, third.

The dairy judges state that there is a uniformity of quality in Quebec butter and cheese that is often lacking in the Ontario products and this they attribute to the special attention paid by syndicates and associations to this important point.

THE PROBLEM IN BUTTER-MAKING

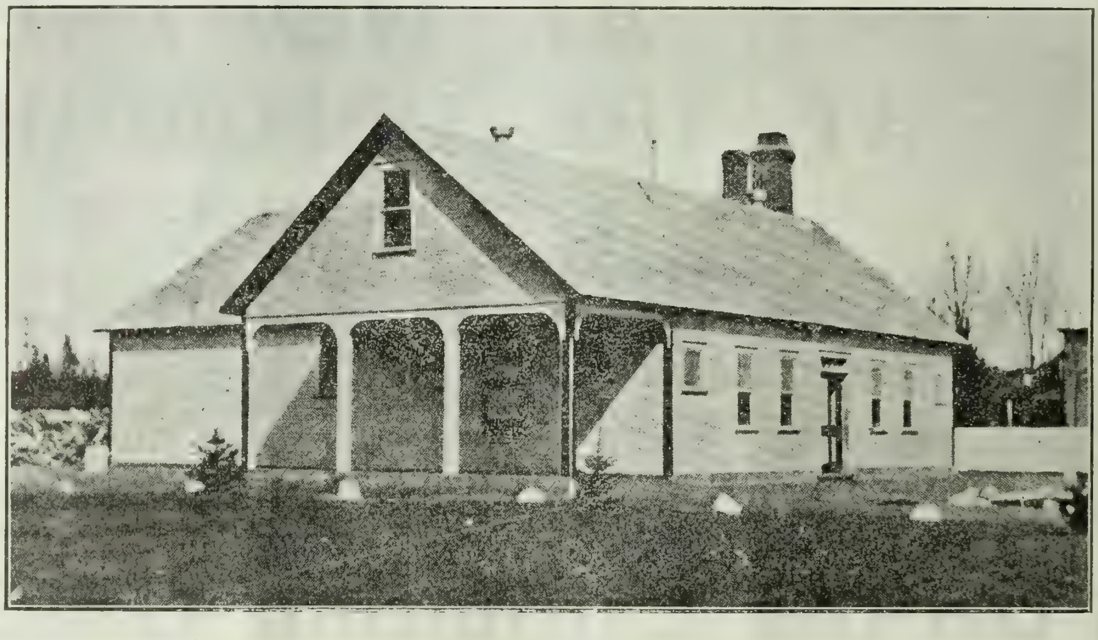
By J. A. Ruddick, Dairy and Cold Storage Commissioner

THE improvement in the quality of Canadian butter in recent years has resulted in a great increase in home consumption and consequent enlargement of the market. Every effort which has been made through the different agencies, both federal and provincial, to raise the standard of quality has been well worth while and the results are a standing encouragement to further effort with the same object in view.

In those sections of the country where the cream gathering system is in vogue, no single measure for the improvement of the quality of the butter is of greater importance, or is likely to be more successful, than that of cream grading. The results already attained in Alberta, Saskatchewan and Manitoba, especially in Alberta, are abundant proof of the practicability and efficiency of the methods which have been adopted in these provinces for the grading of the cream as supplied to the creameries. If cream grading can be supplemented by a workable system of butter grading, which will ensure a fair discrimination in price according to grade, the stimulus thus given to everything which makes for better quality will be very great.

The value of the grading of the cream or butter lies in the fact that it leads to payment on a quality basis. It is the lack of this discrimination in the butter trade generally, especially in relation to the primary sale by the manufacturer, which stands as the greatest barrier to progress that the industry has to face. All arguments or representations looking towards improvement lose their effect when it can be asserted in reply that the butter of inferior quality can be sold at the same price as other butter produced under very much better conditions.

We are not concerned for the moment with the reasons why the merchants are impelled to do business in this way, we merely want to point out a few facts as briefly as possible. This tendency to strike an average value neither encourages the progressive butter maker who turns out a superior article, nor punishes the indifferent or careless maker whose product is of inferior quality. Neither the creamery owner nor the patrons of the creamery can be expected to take much interest in the matter of quality when they see butter of widely different quality being sold for practically the same price. If there were the same discrimination in value in the purchase of butter from the manufacturer as there is in the retail trade the patrons of many creameries would soon awaken to the fact that they were receiving a very much smaller return for their milk or cream than the patrons of other creameries where the business is conducted on better lines. How to secure full value and a reasonable discrimination in price is one of the greatest problems before the dairymen of this country. It is the problem of problems. If it were solved most of the other problems would solve themselves. There is no question before the dairymen of Canada to-day which deserves more careful study and attention.—*Agricultural Gazette.*



A MODEL CREAMERY

The creamery represented in the above illustration has been operated by the Dairy and Cold Storage Branch, at Brome, Quebec, to demonstrate the advantages of certain improvements in creamery buildings; to determine the value of new apparatus and machinery, and new methods and practices in the manufacture of butter; to eucourage the production of winter milk, and to demonstrate proper business methods in the management of creameries. This creamery, erected in 1912, was recently destroyed by fire.

POULTRY

SUGGESTIONS FOR FAIR MANAGERS

Graded Prize Lists. Fewer Breeds. Better Arrangement

Editor Journal of Agriculture:-

I have your circular regarding suggestions for the improvement of the agricultural fairs of the province. There are two features to which I would like to draw the attention of the managers and directors of agricultural fairs.

The first is that general purpose breeds should be given greatest encouragement. Many of the agricultural fair boards give prizes to a number of minor breeds which are of little importance to the farming communities. In order to encourage the breeding of the most profitable breeds of poultry I would strongly suggest the adoption on the part of fair boards of a graded prize list based upon the number of entries in each section. This would encourage keener competition among the more profitable breeds and would tend to encourage poultry raising throughout the country. The model prize list which I beg to enclose also eliminates many of the unimportant breeds. The enclosed prize list is simple and still should give the desired results and I sincerely hope that such a prize list may be adopted by all the fair boards throughout the province.

Another important matter which I should like to mention is the arrangement of the exhibit. I have found that birds are cooped in a very careless manner. Frequently the coops are of such a nature that the birds can hardly be seen, and in the majority of cases they cannot be taken from the coops to be examined by hand. Usually no effort is made to coop the various breeds by themselves. In judging at some of the exhibitions it has taken me as long to locate the various entries scattered throughout the poultry building as it has taken me to judge a particular section. I would strongly suggest that exhibition managers, and particularly committees in charge of the Poultry Departments, should make every effort to have each breed of fowl cooped by itself in consecutive order. If this were done the entire poultry exhibit would be much more uniform and it would have a greater educational value to the public.

M. A. JULL,

Manager and Lecturer,
Poultry Department,
Maldonald College

MODEL PRIZE LIST

Poultry

BIRDS entered in pen competitions will not be allowed to compete with birds entered in single competitions except for specials.

Premiums will be awarded in Classes 100 to 111 for Cock (Sec. 1), Hen (Sec. 2), Cockerel (Sec. 3), Pullet (Sec. 4). Prizes for single birds in each Section will be as follows:—

When entries are:—

	1st.	2nd.	3rd.	4th.	5th.
1 to 5	$0.75	$0.50	$0.25		
6 to 10. . . .	1.00	.75	.50	$0.25	
11 and over. .	1.50	1.00	.75	.50	$0.25

Premiums will be awarded in Classes 112 to 115 for Breeding Pen, to consist of one male and four female as follows:—1st. $2.00; 2nd. $1.50; 3rd. $1.00; 4th. $0.75.

Premiums will be awarded in Classes 116 to 122 for Old Male (Sec. 1), Old Female (Sec. 2), Young Male (Sec. 3), Young Female (Sec. 4). Prizes for single birds in each Section will be as follows:

When entries are:—

	1st.	2nd.	3rd.	4th.
1 to 5	$1.00	$0.75	$0.50	
5 and over	1.50	1.00	.75	$0.50

Premiums will be awarded in Classes 123 to 125 for a Pair, to consist of one male and one female as follows:— 1st. 50c; 2nd. 25c; 3rd. 15c.

Premiums will be awarded in Classes 126 and 127 for One Dozen Eggs as follows:—1st. 50c; 2nd. 25c.

Fowls

Class 100, Plymouth Rocks, Barred.
Class 101, Plymouth Rocks, White.
Class 102, Plymouth Rocks, A.O.V.
Class 103, Wyandottes, White.
Class 104, Wyandottes, A.O. V.
Class 105, Rhode Island Reds, R.C. and S.C.
Class 106, Orpingtons, A. V.
Class 107, Leghorns, S. C. White.
Class 108, Leghorns, A. O. V.
Class 109, Minorcas, Anconas, Campines.
Class 110, Games, A. V.
Class 111, Any Other Variety than above.
Class 112, Plymouth Rocks, A.V.—Breeding Pen.
Class 113, Wyandottes, A.V.—Breeding Pen.
Class 114, Rhode Island Reds, A.V.—Breeding Pen
Class 115, Leghorns, A.V.—Breeding Pen.

Ducks

Class 116, Pekin.
Class 117, Runner.
Class 118, Any Other Variety.

Geese

Class 119, Toulouse.
Class 120, Any Other Variety.

Turkeys

Class 121, Bronze.
Class 122, Any Other Variety.

Miscellaneous

Class 123, Bantams.
Class 124, Pigeons.
Class 125, Rabbits.

Eggs

Class 126, Brown.
Class 127, White.

M. A. J.

POULTRY AT SHERBROOKE FAIR

THE poultry exhibit at Canada's Great Eastern Exhibitions, held at Sherbrooke, Sept. 4th to 11th, was the largest for years past. The entries totaled over 600 in number more than those of the preceeding year, and taken on the whole the quality was in keeping with that of any of the previous shows. Many classes were very much better than in former years and this was especially true of the young stock. To the average onlooker things may appear much as usual, but to the eye of the experienced poultryman a rapid transformation is very evident. This rapid change is of a very desirable kind, and what is even more encouraging to the industry is the fact that this change is being brought about by the young men of the province.

Many new exhibitors appeared this season, and judging by the interest shown we can only say to the older and more experienced breeders that they also must improve or be content with second place. Surely "A word to the wise is sufficient".

As in past years the management was all that could be desired. Director Wilson, Superintendant Archambault and the various employers were ever ready to render assistance or valuable advice, and notwithstanding the extreme warm weather which prevailed the birds were in the best possible condition at the end of the show.

The cooping of the birds in wire coops was an added feature to the show, and while the entire exhibit was not cooped in wire we feel sure the time is not far distant when the old wooden coop will be a thing of the past. Larger and better lighted coops would add greatly to the appearance and comfort of the turkey and waterfowl exhibit.

The breeds best represented were the utility breeds, such as Plymouth Rocks, Wyandottes, Rhode Island Reds and Orpingtons. The Leghorns were also out in full force and competition was remarkably keen. Asiaties too were well represented and the French, Polish and Hamburg classes were well filled, with many excellent specimens as prize winners. Games and Bantams brought out many grand birds and pigeons occupied their former position. In number the exhibit of Turkeys Geese and Ducks was not large but the winners were, in most eases, grand specimens.

Some of the principal exhibitors were as follows: Barred Plymouth Rocks shown by Mr. W. H. Griffith, Sherbrooke, A. P. Hillhouse, Foster, and N. McMonagle of Sussex N. B.; White Wyandottes by Mr. Murray of Sherbrooke; Rhode Island Reds by F. B. Wilson and Mr. Plante of Sherbrooke, C. C. Hunt of Rock Island, Mr. McFadden of Ottawa and Lennox Red Farm of Napanee, Ont. Buff Orpingtons were shown by Mr. Armitage of Sherbrooke while the blacks were shown by Mr. Pierce of Sherbrooke and Mr. Miles of Point Fortune. The latter also showed White Orpingtons. In Light Brahmas Mr. L. Cabana of Sherbrooke and Point Fortune Poultry Yards were the must successful. Leghorn exhibitors were too numerous to mention and the awards were well divided. In French, Polish and Hamburgs, Games and Bantams, J. H. Warrington of Cornwall and Point Fortune Poultry Yards were the leading exhibitors and divided the awards about evenly. In Turkeys, Geese and Ducks Taylor Bros of Ormstown carried off most of the awards. In addition to the above numerous other exhibitors could be mentioned and justly so, but space will not permit.

A. G. T.

FATTENING POULTRY FOR MARKET

A roaster which tickles the palate best is one which is young, full grown, plump and well finished. Such a one will roast more nicely than one with more bones than flesh. A chicken is "ripe" as a choice roaster for only a short time. After a pullet has commenced to lay eggs, her flesh is not of the same quality as it was before she laid an egg. When the spurs of a cockerel begin to harden the flesh begins to get tougher. A good roaster must always be plump and fat; that is, it must be well finished where the fat and lean meat is well intermixed in good proportions. A well finished and good appearing chicken will serve well, while the unfinished chicken lacks in flavour, and when prepared for the table may present anything but an appetizing appearance.

The majority of farmers in Quebec take but little trouble in properly preparing their poultry for market. The consumers, or the general public, are so accustomed to purchasing dressed poultry of poor quality that they usually do not recognize the difference between a poor roaster and a well finished one. If the poultry is well fattened, properly killed and dressed, there are few kinds of meat as wholesome and with as much flavour.

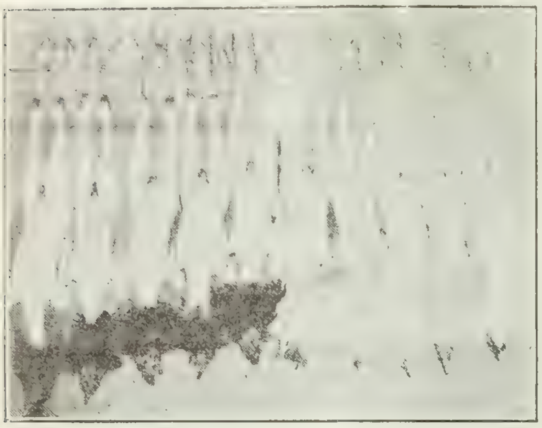
A thin bird is not attractive when dressed and is not appetizing when roasted. The flesh appears shrunken and the bones are prominent. When roasted, the meat is dry and tough.

A WHITE PLYMOUTH ROCK COCK.—This bird is an excellent breeder for the production of roasters; he has good type with good width, moderate length of back, a well developed breast, long keel and medium length of leg.

A plump, well finished chicken has a rich flavour and "tastes like more". There is an abundance of tender meat of good quality.

The fattening of poultry then, is a finishing process. The object in fattening is to prepare in the best possible way poultry flesh for human consumption.

There is always a demand for dressed poultry. Poorly fattened birds, however, bring low prices, and sometimes no profits at all are made in selling them. Plump birds are by far in greatest demand at highest prices, and birds of high quality always yield the largest profits. Fattening, then,



ROASTERS.
Rhode Island Reds and white Wyandottes make good roasters. These birds are well finished, having been crate fattened for three weeks.

means heavier birds and higher prices. There is usually 5 cents or more a pound difference in price between thin and plump poultry.

Best results are obtained by feeding all fattening birds on soft mashes. The gain in weight is greater and the quality of the flesh is superior when wet mashes are used than when the chickens are fed whole grain. The ground grains used to make up the mashes are usually oatmeal feed, finely ground buckwheat and cornmeal. Low grade flour and middlings may also be used.

A good fattening ration is composed of equal parts oatmeal feed, finely ground buckwheat, and cornmeal. The proportion of oatmeal feed may be increased, for it is one of the best fattening foods we have. It is a by-product of the oatmeal factory and is much cheaper than oatmeal itself. The actual price of each grain will determine its value as a fattening food; in some cases large profits will be made by feeding a ration largely composed of oatmeal, and at other times, depending upon prices, a varied ration may be more profitable.

These ground grains should be mixed thoroughly and the mixture then moistened with sour skim milk. Milk is an excellent food for fattening chickens. It tends to develop the tissues and improves the quality of the meat. The proportion of milk to the mash mixture is about 2 lbs. of milk to 1 lb. of mash by weight. Best results are secured when the food is mixed twelve hours previous to feeding. Give the birds grit once a week during the fattening period.

There are two methods of fattening poultry for the market. The method usually employed on the farm is the pen method, where the birds are confined in a pen or box stall. The other method is crate fattening and is usually more profitable.

The stock which is to be fattened will consist of cockerels and probably a few pullets which are not suitable to be kept over for laying or breeding purposes. Whether they are to be pen fattened or crate fattened, they should be starved for 24 hours. This cleans out the digestive systems of the birds and puts them in good shape for the special feeding during the fattening period.

In pen fattening all of the stock is crowded into a small pen so that the birds will be kept quiet and cannot exercise much. If the room is slightly dark all the better, as the birds will not be restless. Here the birds are kept for about three weeks, being fed twice or three times daily. If fed properly they will put on flesh quite rapidly and will come out nice and plump.

Great care should be taken not to feed the birds too much during the first week of the fattening period. Feed very lightly. Give the birds just enough wet mash so that they will eat it all up clean and be just a little hungry for more. For the second week feed a little more heavily, and feed all they will possibly eat the third week.

Where only a few chickens are to be fattened, the pen fattening method can be employed with good profit.

Where a large number of birds are to be fattened the most economical method is to feed them in crates or batteries. The birds will make larger gains and the quality of the meat should be superior to pen-fattened birds. Poultry buyers nearly all prefer crate-fattened birds.

A good crate can be made of laths, and a few light boards which are used for the ends and partitions. The crate should be 6 feet 6 inches long, 20 inches high, and 16 inches wide. The top, back and bottom are made of laths running lengthwise. The laths on the top and back should be about 1½ inches apart. The laths in front run up and down and are placed about 2 in. apart, so that the birds may eat from the V-shaped trough in front of the crate. The laths on the bottom are usually placed ¾ inch apart. Care should be taken to have the back slat on the bottom at least ¾ to 1 inch from the back, so that the droppings may pass trough and not accumulate.

A V-shaped trough, 2 inches deep and 2½ inches wide at the top is placed on brackets in front of the crate. It is raised about 2 inches above the level of the bottom of the crate.

The crate, when finished, should stand on legs about 2½ or 3 feet high.

Use the same precautions in feeding as when fattening in the pen. Feed lightly at first, then heavily towards the end of the three weeks. It is very important to keep the birds with keen appetites.

The fattening crates should be placed in a cool comfortable place, and where the birds will not be disturbed. The birds should be dusted with powder to rid them of lice and mites, otherwise they will not fatten most profitably.

Each chicken should gain about 1 pound in weight after three weeks of careful feeding.

M. A. JULL

WOMAN'S WORLD

COWANSVILLE HOMEMAKERS' CLUB

On Saturday August the seventh the Cowansville Homemakers' Club held an open meeting at the home of Mrs. Wm. Beach, the county president. Members and friends of the different Homemakers' Clubs of the county were present. At this meeting Mrs. Wm. Miltimore gave a report of the Homemakers' Clubs convention which was held at Macdonald College in June. Mr. E. A. Lods gave a short talk on his trip to the Panama-Pacific Exposition. The program concluded with a well rendered recitation by Mrs. Dawson Gilbert. At the conclusion of the program refreshments were served after which a collection was taken to assist the club in the Red Cross work. Altogether a very enjoyable afternoon was spent. It is hoped that at the next meeting of this character more of the men will be present to spend with their wives and friends a pleasant afternoon.

Breakfast Muffins

FOODS AND FOOD PREPARATION

Lesson XIX

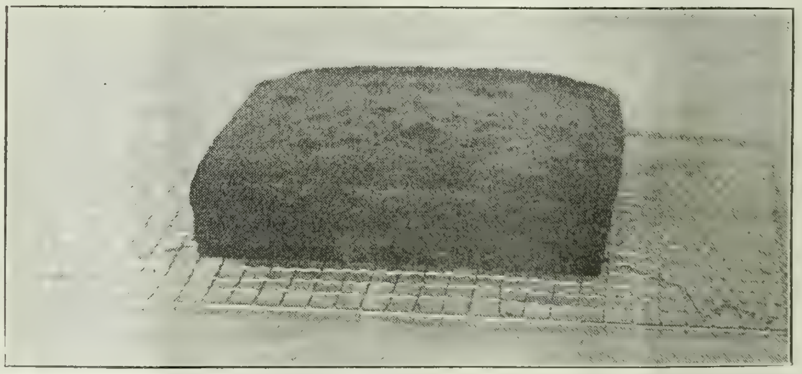
Flour Mixtures

Miss H. S. Johnson in an article in the Good Housekeeping Magazine says: "How to measure and then *persistence in doing it*, is one of the first maxims of good cooking."

This maxim holds good in respect to all cooking but it is absolutely *essential* in the making of flour mixtures if the occasional failures are to be avoided and the best results obtained. For this reason the rules for measuring given in Lesson 11, February, 1914, number of the Journal are repeated:

Level Measures

3 Teaspoons = 1 Tablespoon.
16 Tablespoons = 1 Measuring Cup.



Standard Cake on Cooler.

All the necessary ingredients and utensils together

2 Cups = 1 pint.
2 Pints = 1 quart.

(Note:—Measuring cups are more convenient when marked in thirds and quarters.)

Unfortunately for the housekeeper, we have not as yet standard measuring cups and spoons, but we hope the day is not far off when all measuring cups will be equal to one-half the Imperial pint. When "cup" is used in these lessons one-half the Imperial pint is meant and not teacups of various sizes.

All materials are measured level — i.e. by filling cup and spoon more than full and levelling with a case knife. In measuring powders hold the knife vertically. In substances like sugar level with surface of knife. Halve and quarter with edges of knife.

To measure a cupful put the material in by spoon or scoop, round slightly, then level with a knife. Do not shake the cup to settle the material. Remember that a rounded teaspoon is equal to two level ones.

Recipes. Of the making of recipes there is no end, but after all, most of these are just variations of the simple basic recipes for doughs and batters. Take any cook book and compare the recipes and you will readily see that in general one differs from another very slightly indeed. The student of these lessons is advised to study the schedules given for doughs and batters with ths hot biscuit and the muffin as basic recipes, all those following being embellishments of these.

Classification of Doughs and Batters.

1. Pour Batters — Waffles, griddle cakes, popovers—fritter batter.
2. Drop Batters — Muffins, butter cakse, steamed and baked puddings.
3. Doughs — (a) Soft doughs—biscuits, short cakes, doughnuts.
   (b) Stiff doughs—cookies.

Note:—This does not include bread and pastry.

Method

1. Cream the butter with a wooden spoon.
2. Add sugar and rub *well* together.
3. Add well beaten eggs.
4. Add the milk and then the mixed and sifted dry ingredients.
5. Beat mixture well.

Note:—All drop batters calling for melted shortening are combined as for Pour Batters, e.g. corncake.

Preparation

1. Get all the necessary ingredients and utensils together. Have pans greased. Line the bottom with paper if necessary. Christmas cake requires three thicknesses of paper on both sides and bottom of pan.

2. Attend to the fire. It must be in such a condition that it will not have to be remedied or attended while baking is going on (this is in the case of a coal fire).

3. Grease pans with either a brush or a piece of clean white paper which should be burned after using. Never use newspaper or the wrappers off parcels. If a brush is used see that it is kept sanitary. Wash, clean and dry in the sun.

1. *Know* the oven. Ovens, like people, have habits of their own, and no definite rules concerning them can be laid down for guidance to success. The following, however, always apply, but to them one must add the knowledge that comes from experience and practice.

Oven temperatures:

(1). Very hot oven — piece of white paper browns in 3 minutes. Suitable for biscuit and pastry.

(2.) Hot oven — Piece of white paper browns in 5 minutes. Suitable for rolls and muffins.

(3.) Moderate oven — Piece of white paper browns in 7 minutes. Suitable for bread, gingerbread, cake, cookies.

(4.) Slow oven — Piece of white paper browns in ten minutes—suitable for sponge cake.

2. Have *good materials* — fresh eggs, good butter and flour and the sugar not coarse but finely grained.

3. The butter and sugar must be *well creamed.* If the sugar is not dissolved before the cake is baked, the grains in melting in the cake in the oven make holes in the cake and spoil the texture. A cake may be light and very good to eat with but little beating, but beating alone makes a fine-grained cake. If a recipe calls for more sugar than can be creamed well with the butter, beat part of the sugar with the yolks of eggs.

4. If one egg only is used it should be beaten light without separating and added to the butter and sugar. If more eggs are used , it is well to beat the yolks and whites separately, add the yolk to the butter and sugar and last of all *fold* in the whites which should be beaten to a *dry stiff froth.* The whites are beaten to break up the albumen and fill it with air. Never stir a cake mixture after adding whites. Fold them in or the air which has been incorporated into them by beating will be lost. *Folding* is a turning over and over of mixture allowing bowl of spoon each time in contact with the bottom of the dish.

5. In baking a cake such as a Standard Cake, during the first ten minutes the cake should rise. During the second ten minutes the cake should rise and begin to brown and during the last ten continue to brown, settle a little and draw away from the sides of pan. Do not move a cake until it has risen to its full height. After that there is no danger of its falling. If the oven is too hot raise the back covers of the stove. To prevent a cake from burning put a pan of cold water into the oven.

6. In filling pans with batter, fill the corners and sides, leaving a *slight* depression in the centre so that the cake when baked will be evenly shaped.

7. Fruit and pound cakes are done when they are firm, yet springy to the touch.

A wholesome and palatable change in the diet from finely bolted flour is the use of Roman Meal for bread and muffins. This meal is made from rye, flaxseed and wheat and is especially recommended when it is necessary to add bulk to the food to increase peristaltic action.

Roman Meal Muffins

1½ cups Roman Meal.
1 egg.
2 tblsp. sugar.
1 teasp. salt.
½ cup wheat flour.
½ teasp. soda.
2 tblsp. melted fat.
1 cup sour milk.

Sift soda with wheat flour. Beat egg well, add sugar, salt, milk and melted fat. Add the white flour. Beat well and then add the Roman Meal.

SCHEDULE FOR DROP BATTERS

Name	Flour.	Liquid.	Sugar	Salt	Shortening.	Eggs	Lighthening Agent.	Flavoring	Other Ingredients
Muffins	1½ c.	½ c. milk	3 tblsp.	¼ teasp.	3 tblsp. butter	1	3 teasp. baking powder		
Standard Cake	1½ c.	½ c. milk	¾ c.	¼ teasp.	¼ c. butter	2	3 teasp. baking powder	1 teasp. vanilla	Optional: ¾ c. chopped walnuts or 2½ oz. melted chocolate, or 1 c. grated cocoanut or 1 teasp. cinnamon.
Richer Standard Cake	1¾ c.	½ c. milk	1 c.	¼ teasp.	½ c. butter	3	3 teasp. baking powder	1 teasp.	
Chocolate Cake	1½ c. to 1¾ c.	¼ c. milk.	1½ c.	¾ teasp.	9 tblsp. butter	4	3 teasp. baking powder	1½ teasp vanilla.	2½ oz. melted chocolate or 6 tblsp. cocoa.
Steamed Batter Pudding	1¾ c.	½ c. milk	½ c.	¼ teasp.	¼ c. butter	1	3 teasp. baking powder		

Baked Batter Pudding	[illegible]	½ c. milk	½ c.	¼ teasp.	¼ c. butter	1	3 teasp. baking powder		
Snowballs	2¼ c.	½ c. milk	1 c.	½ teasp.	½ c. butter	4 whites	3½ teasp. baking powder		
Suet Pudding	1½	½ c. milk or water	½ c. molasses	½ teasp.	½ c. chopped suet		½ teasp. soda	½ teasp. cinnamon ½ teasp. allspice	½ c. fruit—raisins, dates or figs.
Corn Bread	1 c. white 1 c. corn meal	⅞ c. milk	as desired	½ teasp.	¼ c. melted butter	1 or 2	4 teasp. baking powder		
Brown Bread	3 c. Graham or 2 c. Graham and 1 c. white	2 c. sour milk	3 to 4 tblsp. molasses	1 teasp.	2 tblsp. melted butter		2-3 tblsp. soda		Optional ½ c. dates or raisins.
Ginger Bread	1½ c.	½ c. sour milk	¼ c. (brown)	⅓ teasp.	4 to 5.tblsp. bacon dripping	1	¾ teasp. baking soda	½ teasp. ginger ½ teasp. cinnamon	½ c. molasses, ½ c. raisins if desired.
Spice Cake	2 c.	1 c. sour milk	1 c.	½ teasp.	½ c. butter	1	1 teasp. baking soda	1 teasp. cinnamon ½ teasp. allspice	1 c. raisins.
Apple Sauce Cake	1¾ c.	1 c. apple sauce	1 c.	½ teasp.	½ c.		2 teasp. baking soda	1 teasp. cinnamon 1 teasp. cloves	1 c. raisins. 1 teasp. nutmeg
Christmas Cake	1 lb.	1 c. golden syrup	1 lb. Demerara sugar		1 lb. butter	12	½ teasp. baking soda	1 teasp. each cinnamon, allspice and cloves	1 c. canned strawberries and ½ c. brandy.
Hermits	3 c.	½ c. sour milk	1½ c. brown	½ teasp.	½ c. butter or dripping	2	1 teasp. baking soda	2 teasp. cinnamon, teasp. cloves, a little grated nutmeg	1 c. raisins.
Plum Pudding	1 lb.	1 c. milk	1½ lb.	1 tblsp.	1½ lbs. suet	6	1 tblsp. baking soda	Spices to taste	3 lb. raisins, 3 lb. currants, 1 lb. bread crumbs.
Pound Cake	1 lb.		1 lb.		1 lb. butter	10		½ teasp. mace.	2 tblsp. brandy if desired.
Date Bread	3½ c. Graham ½ c. corn meal	1 c. butter milk ¾ c. syrup ¼ c. molasses	¼ c. brown	1 teasp.		2	1 teasp. soda		1 lb. dates.

SCHEDULE FOR DROP BATTERS

NAME	REMARKS.
Muffins	Bake in hot oven in buttered muffin tins for about twenty minutes. This makes six muffins.
Standard Cake	Currant or raisin cake may be made by using this mixture and adding to it at the last ½ c. stoned, washed raisins or same amount of currants.
Richer Standard Cake	Any one of the optional ingredients indicated for Standard Cake may be used. If frosting is used reserve one egg-white.
Steamed Batter Pudding	Steam 1½—2 hrs. or steam in individual moulds for thirty-five minutes. Fruit may be stirred into mixture before steaming.
Baked Batter Pudding	Apples may be prepared in pudding dish and then this mixture poured over them. Bake as one pudding or in muffin tins. Serve with any sauce.
Snowballs	Steam thirty-five minutes in buttered cups. This makes eight servings.
Suet Pudding	Steam two hrs. or steam thirty-five minutes in six small moulds. Half Graham flour may be used.
Corn Bread	Bake in moderate oven in baking sheet 2—2½ in. thick. Sour milk may be used with teasp. soda.
Brown Bread	Bake one hour in slow oven. Set pan in hot water for thirty minutes.
Gingerbread	Oven less hot than for other butter cakes. Do not cut while hot. Break or split, using two forks.
Apple Sauce Cake	If apple sauce is thin use more flour. This cake is better when fresh.
Christmas Cake	At last mix in well the following dredged fruit: 3 lbs. raisins, 2 lbs. currants, ½ lb. figs, ½ lb. peel, ½ lb. almonds, (shelled, and browned). Bake in slow oven from four to five hours.
Hermits	Drop from spoon to buttered sheet, leaving spaces between. Use fresh.
Plum Pudding	1½ lbs. currants, ½ lb. peel and 1 lb. almonds may be substituted for raisins and currants in recipe. Steam three hours.
Pound Cake	Add well beaten yolks to well creamed butter and sugar mixture and beat well. Add stiffly beaten whites and then dry ingredients. Bake about one and a half hours in a moderate oven. Line both bottom and sides of pan with thick paper.
Date Bread	Bake in shallow pans as Brown Bread.

HYMN FOR AIRMEN

Lord, guard and guide the men who fly
Through the great spaces of the sky,
Be with them traversing the air
In darkening storm or sunshine fair.
Thou Who dost keep with tender might
The balanced birds in all their flight,
Thou of the tempered winds be near,
That, having Thee, they know no fear
Control their minds, with instinct fit,
What time, adventuring, they quit
The firm security of land :
Grant steadfast eye and skilful hand.
Aloft in solitudes of space
Uphold them with Thy saving Grace.
O God, protect the men who fly
Through lonely ways beneath the sky.

M. C. D. H.

We never favored keeping dairy calves in a thin, half-starved condition. Many seem to think that the dairy calf must not be fed very much for fear of it developing a beef type not conductive to heavy milk production. Feed the calves well and do not worry if the young heifers get a little thick. If they have milking breeding then they will soon milk down when they freshen and are far more likely to make good cows than heifers raised on scant rations with poor care.—*Farmer's Advocate.*

"LOVE'S LABOR'S LOST".—Luke had been sent to the store with the mule and wagon. What happened is told in Luke's end of the conversation over the telephone from the store.

" Gimme seb'n-'leben.

" Gimme dat number quick, please'm.

" Dis yer's Luke, suh.

" Dis yer's Luke, I say, suh.

" I tuk de wagon to de sto' fo'dat truck.

" Yas, suh, I'm at de sto'.

" Dat mule, she balk, suh.

" She's balkin' in de big road, near de sto'.

" No, suh, she ain' move.

" No, suh, I don' think she's gwine move.

" Yas, suh, I beat 'er.

" I did beat 'er good.

" She jes' r'ar a li'l bit, suh.

" Yas, suh, she kick, too.

" She jes' bus' de whiffletree li'l bit, suh.

" No, suh, dat mule won't lead.

" Yas, suh, I tried it.

" No, suh, jes' bit *at* me.

" No, suh, I ain't tickle de laigs.

" I tickle um las' year, suh, once.

" Yas, suh, we twis' 'er tail.

" No, suh, I ain' done it.

" Who done it?

" I t'ink he's li'l travelin' man f'um Boston, suh. He twis' 'er tail.

"*Yas, suh! She sho' did!*

" Right spang in de face, suh.

" Dey's got 'im at de sto'.

" Dey say he's comin' to, suh.

" I don' know—he do look mighty sleepy to me, suh.

" Yas, suh, we tried dat.

" Yas, suh, we built a fire under 'er.

" No, suh, dat ain' make 'er go.

" She jes' move up li'l bit, suh.

" Yas, suh, de wagon bu'n right up. Dat's whut I'm telephonin' yu 'bout—to ast yu please sen' a wagon to hitch up to dis yer mule. She ain' gwine budge lessen she's hitched up. Good-by, suh".—*New York Evening Post.*

Stop—Look—Listen at the level railway crossing and avoid a tragedy.

OF GENERAL INTEREST

CONSERVATION OF SOIL MOISTURE

(Continued from our September issue)

3. By keeping down weeds. Every bit of moisture used by weeds is lost to be cultivated plants. Surface tillage, hence, usually accomplishes two purposes; it destroys weeds and maintains an earth mulch.

4. By planting windbreaks. A dry, hot wind which sweeps over the surface of the soil with great velocity has enormous drying power; and windbreaks, by moderating the force of the wind are of considerable value as conservers of soil moisture.

The wise agriculturist will try to understand how soils hold or lose moisture, and when he understands this he will be able to adapt his methods to the requirements of his crops and to climatic conditions. A knowledge of general principles is of highest importance, and I shall be satisfied if I have given you any clear idea of the general principles underlying the practice of conserving soil moisture.

REDUCING DAIRY COSTS

OVERHEAD charges, including management, maintenance rations, interest on cost of cows and equipment and depreciation of the same must all be examined with a view to cheapen production. We are aware that many dairymen do not value their services as managers of their work very highly. Such men would count it extravagant to attempt to cheapen production by setting aside ten dollars for each cow as the manager's salary.

It is the manager who selects or rejects the cows; who knows if they are cheapening production. He selects their feeds and their feeders and if he does not earn ten dollars for each cow above the man who is not a manager let him serve another apprenticeship either in the school of experience or go to college. As we go from one herd to another a good cow is treated mostly as an accident and the poor one as a misfortune. For the best selection of cows, some have required their herds to come to a fixed standard, and those failing to reach this requirement have been replaced by heavier producers.

If a man reaches efficiency in selecting and caring for his herd, let him then increase the number of his cows. If with six in the row he can reach 400 pounds of butter fat for their average and count that his skill was worth sixty dollars, let him build up his business to twenty, thirty or sixty cows, thus increasing his salary and declaring a dividend. Our many inquiries for silos and barns to accommodate six to eight cows makes us suppose the writers debate whether to be dairymen or not to be dairymen and compromise by the most expensive plan—the little eight or ten-foot silo and the small cow stable costing much more per cow than equipment for fifteen or twenty cows. For six cows they do not think they need to study with the same zeal as for a larger business and the loss runs through the whole outfit.

It costs a certain figure for a cow's maintenance that is to keep her living respectably without producing milk. One may think of the man who is no manager keeping two cows upon such a ration with the result of their having nice horns and hoofs, a high pelvic arch and effeminate face and neck, but alas very little udder. Such cows will make butter, if at all, at such a price that only the favored few can eat it. Again, we take the same cows and feed them to their capacity, they come to profit with a goodly supply of fat, their udders develop, they return three or four dollars for each dollar's worth of feed they eat. The real dairyman has little time to look at their horns, hoofs or tails—it is their udders that interest him.

Could we speak for the undeveloped cow held in disgrace and poverty from the need of the same feed that would assist her master to profit, we would have a commission in every township to convert the clever stock feeder into a dairyman not to merely hold his cows over till grass comes but to develop them into dairy animals. We find well-bred cows wintering around the straw stack dried off for the winter to freshen with the new pastures and give a flush of milk till the flies and drouth retire them to the maintenance or boarding list. We find other small herds with silage, chop and oil meal doing fairly good work but never well developed; to such we would have this wise commission: prescribe one pound of cottonseed meal, gluten and corn meal for each three pounds of milk they give. So many will say their silage was well eared and they were not feeding much grain, others are not in reach of a fair market and decide it does not pay to feed.

The cow that eats 33 lb. of ensilage per day when we value ensilage at $3 a ton costs her owner $1.50 per month. Allowing this as her maintenance we have $18 per year. She should be worth $100 at three years of age and her depreciation and interest would be $12 more. The manager's salary would be $10. The interest, depreciation and upkeep of her stable, separator, coolers, cans, etc., gives us a fixed expense account of about $50, allowing $15 worth of manure to pay for her care, milking, hauling of feeds, and the calf if it lives to meet insurance, taxes and sundry incidental charges. Without feeding for production we have a set charge of $50 for each cow.

If she gives 6,000 pounds of 5 percent milk, she gets $30 of a charge for a ton of feed. The butter at 30c per pound makes her return $90, the skim-milk $10 more, making $100 at a cost of $80. A few years ago we set these figures upon our books as a standard toward which to direct our efforts. Now we are ready to raise this standard and aim at the 400 pounds of butter with $133 total income at an expense of about $90. After paying our bills, the remaining $43 has much more encouragement for the business than $20 as above.

It is this line of argument that helps to cheapen production costs. If we do not make our herds reach this level we will be trimming off the laggards and have the satisfaction of acting well our part. Upon this maintenance ration of ensilage and pasture without grain, a strong dairy temperament may give 100 pounds butter fat but the profit and development are lacking.

We are aware that the above figures do not apply to exceptional cases. Many a cow stable is made warm and comfortable by the use of building paper or rough boards well stripped over the cracks. Many a good cow is bought for $30 and lastly many a competent man will throw in his services as manager and from such surroundings we have another set of figures that have almost nothing for overhead charges but they fail to reckon fairly with the slate roofed barn, the swinging stanchions and the silo or the bargain cow that the other fellow failed to develop. When the grocer tells us what it costs to keep store, or when the manufacturer tells us the cost of our table or our clothes they never begin on the cheap basis. When we buy their goods we may rest assured that what we pay will be enough to cover all the expenses of production.

We've drifted into a sort of a Yankee notion that whatever the cow yields above the cost of her feed is clear gain; that by some good fortune another man will have her when her teeth are gone; that her care only costs a little exercise morning and evening for which we enjoy better health than the fellow who lay abed or foafed while we milked and fed. By such figures milk is produced at a cost that astonishes the city man and causes much misunderstanding.—*Ohio Farmer.*

FARMERS SHOULD BE STUDENTS

IT is a well known fact that nothing stands still for any great length of time; things either go forward and improve, or go backward and deteriorate.

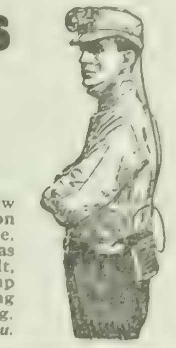
If a lawyer has ambition to become a better lawyer, he does not diminish his study of the law, but rather increases it. If a doctor would attain to the highest pinnacle of his profession, he does not practice medicine as it was taught and practiced 100 years ago, but he reads and studies the new ideas as advanced by known leaders and experimenters of to-day. Carpenters, printers, stone masons, miners, merchants — all have discarded old and out of date methods for newer and more economical ways in which to do their work.

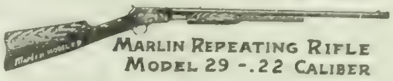
Trappers
Prospectors
Hunters

Order by Mail

The No. 44
JUSTRITE
HEADLIGHT

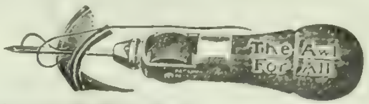
Self lighting, will not blow out. Burns 10 hours on one charge of carbide. Furnished complete as illustrated with cap, belt, two lenses—one for camp purposes and a special long distance lens for hunting. *Price $4.50 delivered to you.*





MARLIN REPEATING RIFLE
MODEL 29 -.22 CALIBER

Take down model, handles 22 calibre rim fire short, long or long rifle cartridges without change or adjustment. Magazine holds 15 short, 12 long or 11 long rifle cartridges. Trombone action, solid top, side ejection. Guaranteed by the makers for accuracy and reliability. *Price delivered to you $11.50.*



THE DIAMOND POINT
LOCKSTITCH SEWING AWL

is a necessity in every household to repair shoes, harness, canvas and all kinds of heavy sewing. Tension automatically controlled by the finger tips. No springs or levers. A child can operate it. Each awl equipped with a supply of waxed thread. Diamond point needles straight and curved. *Price delivered to you 75c.*

HALLAM'S ANIMAL BAIT & TRAIL SCENT

will greatly increase your catch of furs. *Price delivered to you $1.00 per bottle, or 6 bottles for $5.*

OUR SPORTSMEN'S CATALOGUE

showing lowest prices on traps, guns, shoepacks, camp stoves, fishing nets, etc., sent *FREE* on request. Write for it to-day.

John Hallam
Limited

Mail Order Dept. 908,
Toronto.

FOR SALE—3 nice Yorkshires pigs, born, March the 25th. Also one fine Canadian bull, 18 months old, all registered. Apply to SAMUEL FORTIN, St. Philemon, Bellechasse Cty.

Barred Plymouth Rock Cockerels for sale.

For sale in November, about twenty fine Barred Plymouth Rock cockerels, purebred, one dollar and fifty cents each, delivered at station. J. P. GAUTHIER, New Richmond Station, Bonaventure Cty, P. Q.

ONTARIO
BUSINESS COLLEGE
Belleville, Ont.

(49th Year)

O. B. C. training qualifies you for the highest business career.

SEND NOW for the convincing catalogue to Principal J. W. JOHNSON, F.C.A.

IS THE FARMER CARELESS?

Have we as farmers kept up with the procession? Let us investigate. Do men who wish to become farmers, in the great majority of cases, think it necessary to go through a prescribed course of study? They do not. Do they read up on the newest and best methods of agricultural practices as studied out by the experimenter and the best up-to-date farmers of their state and nation? No. How do they learn the art and science of agriculture? Through the reading of agricultural literature? No. Well, how? Why, by observing the way father does it, who also does it the way his father did it; in this way they learn the art, not the science, for in most cases there is no science, and what art they learn, unless the great-grandfather, grandfather and father were men above the average of their day, is 100 years behind the times, if we except the use of improved machinery, which is, in most cases, the result of deep thinking, not on the part of farmers, but on the part of machinists or the men of the shops.

KEEPING UP WITH THE PROCESSION

We maintain that in order for a man to be a successful tiller of the soil he must be a student; he must keep up with the procession, and he must not depend upon his ancestors for his education. Father and grandfather may have been successful in their crude ways and in their time, but if they were, that is not saying that we will be successful by using the same methods. They had a soil that was virgin; we have not; they wore home-spun garments, we do not; they depended upon oxen to do their burdensome work and transport them from place to place, we do not; they ate the simplest and plainest food, we do not; they lived in an age when luxuries were few and far between, when privation was the rule and not the exception as it is now, we do not; theirs was an age of subjugation, ours is an age of progression and enlightenment; why not keep up with the procession.

We do not necessarily have to take an agricultural course at a college to be good farmers, but we do have to be students. The knowledge is at hand; we have only to look about us, read, study, and wake up.—*Hoard's Dairyman.*

THE DIVINING ROD

THE United States Geological Survey states in Water-Supply Paper 255, entitled "Underground Waters for Farm Use," just reissued, that no appliance, either mechanical or electric, has yet been devised that will detect water in places where plain common sense and close observation will not show its presence just as well. Numerous mechanical devices have been proposed for detecting the presence of underground water, ranging in complexity from the simple forked branch of witch hazel, peach, or other tree to more or less elaborate mechanical or electric contrivances. Many of the operators of these devices, especially those who use the home-cut forked branch, are entirely honest in the belief that the working of the rod is influenced by agencies—usually regarded as electric currents following underground streams of water—that are entirely independent of their own bodies, and many people have implicit faith in their own and others' ability to locate underground water in this way. In experiments with a rod made from a forked branch it seemed to turn downward at certain points independent of the operator's will, but more complete tests showed that this downturning resulted from slight and, until watched for, unconscious muscular action, the effects of which were communicated through the arms and wrists to the rod. No movement of the rod from causes outside of the body could be detected, and it soon became obvious that the view held by other men of science is correct—that the operation of the "divining rod" is generally due to unconscious movements of the body or of the muscles of the hand. The experiments made show that these movements occur most frequently at places where the operator's experience has led him to believe that water may be found.

DEALING WITH LIFE AND DEALING WITH THINGS

IN his business the farmer deals with life. He directs in their utilization of plant and animal life, the forces of nature. The engineer, the manufacturer, the store-keeper, and, in fact, most city men, deal with things. In their business, the only life they touch is human life. Speaking broadly, therefore, we feel justified in saying that the farmer deals with life, while the city man deals with things.

It is a rare privilege to deal with life. Life is constantly changing; its possibilities are ever increasing. How it is that green plant leaves spread out in the sunshine, manufacture starch from the carbon dioxide of the air, no one knows. That is life; that operation is at the bottom of the farmer's business. Yet neither he nor any scientist understands it. A fattening steer takes into his paunch hay and corn, and in some way which no one understands, completely tears these foods to pieces, throws part of them away, and puts part of them together again in new forms, in fat and lean meat, so arranged as to tickle the palate of the millionaire dining at the Waldorf-Astoria. How did the steer do it? No one knows. That is life. The scientist has learned part of the story, but he couldn't reproduce the process in his laboratory.

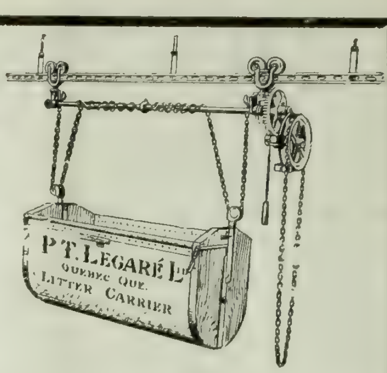
You can't tell what will happen when you are dealing with life. Of course, you know the conditions of life. For instance, you know that plants must have rich soil, sunshine, warmth, air and water if they are to grow. Animal must have air, warmth, water and food furnishing the right proportions of energy—giving and muscle—building materials, if they are to grow. Every farmer knows the conditions influencing plant and animal life. But nevertheless, the problem is

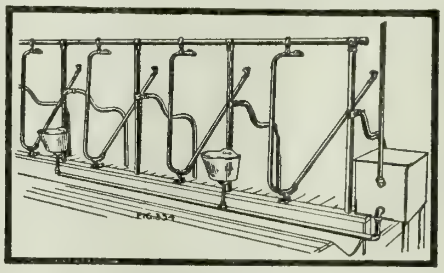
Up-to-date Stable & Barn Equipments

Litter and feed carriers running on roller bearings.

Plans Freely Furnished

Complete installation for moderate prices, convenient and easy to put up in all stables.





Steel Stalls.

Simple and double, mangers with water automatic system. Full description in our CATALOGUE FREELY SENT on request.

P. T. LEGARE, Ltd.
273 St. Paul Street,
QUEBEC.

The most fascinating of all sports

Trap-shooting! The "sport alluring"! The *one great* out door game that appeals to everyone—men and women—young and old.

It's full of interest and excitement and with a little practice transforms the "couldn't-hit-a-balloon" amateur into a "crack shot."

Everywhere in Canada, trap-shooting clubs are springing up. If there's one in your town, join it. If not, let us help you to start one.

Get the trap-shooting habit. Also get the habit of shooting Dominion Shells, which are used by more Canadian trap-shooters than all other makes combined.

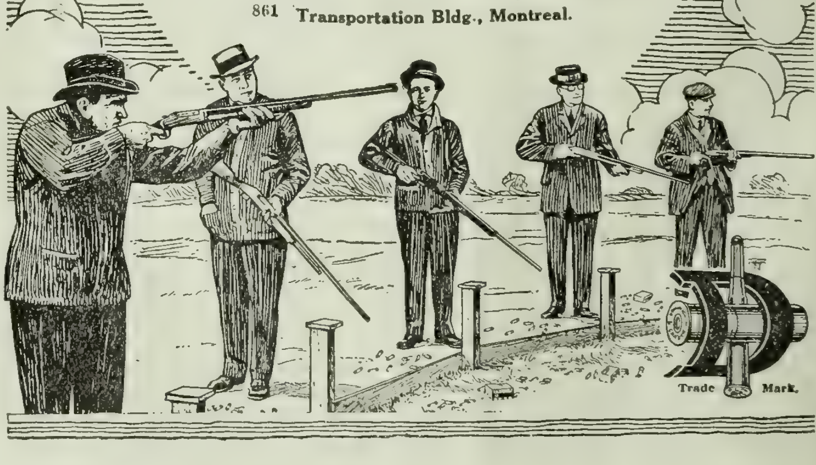
The reason is simply "all round dependability"—the result of first class materials, a well equipped factory and workmen of the highest skill.

Look for the "Big D" on every box of Dominion Shot Shells and Metallics. It's a guarantee of perfection.

Dominion is "the ammunition made wholly in Canada", and sold everywhere.

Any trap-shooting information will be gladly supplied free upon request. Address:

DOMINION CARTRIDGE CO., LIMITED
861 Transportation Bldg., Montreal.



always too big for his understanding. Even if he could control weather, insect pests, and fungus diseases, the life of the plants and animals he grows would still be too much for him to understand. For that reason, farming is not alone a matter of mere intelligence—of scientific understanding. For the best results there should be scientific understanding, but there must be more—shall we call it sympathy? We are referring now to the pleasure of the good feeder as he sits on the fence in the idle enjoyment of watching his hogs eat. Such a man will assure you that time so spent is profitable. We are referring to the feeling of satisfaction which comes over the grain farmer as he looks over his corn field. Such a man can almost feel how it is to be a plant. He knows what it is that the plants want, not so much with his mind as with his heart. Genuine farming draws on more than a man's mind; it calls into play the sympathies.

The city man deals with things. Things are different from life; you can count on them; they always act the same. For instance, a miller buys wheat from the farmer. He knows about what he will have to pay for wheat, one year with another. There is some uncertainty, but not one-tenth as much as the farmer faces when he deals with life, and the forces of nature. The miller grinds his wheat with water or steam power. He knows how his machinery will act, for machinery is a thing, not life. The miller sells his flour, and during the whole process of his business has come in contact only with human life. To succeed, the miller must have business intelligence, a scientific understanding of his business. But in his business is not required the sympathy that is required of the farmer. In dealing with the human life under him, he must use more or less sympathy as distinguished from intelligence. Nevertheless, we are quite sure that one of the essential points of difference between the farmer and the city man is that the former deals more particularly with life, while the latter is especially concerned with things.

One of the great reasons for the inherent strength of the farming class is that the farmer deals with life rather than with things. Because he is dealing with life, the farmer is in far deeper sympathy with the world as it really is than the city man can hope to be. By contact with men and wide traveling, our city man may become a polished man of the world. Surrounding him may be all the luxuries of modern civilization. In his house are electric lights, steam heat, porcelain toilet arrangements, tapestried walls, great paintings, and wonderful sculpture work. He may have access to geat libraries, the privilege of hearing the great musicians of the world. He may have power over millions of money and thousands of men. All these things, and more, a city man may have, and yet with all his opportunities, his culture, power, and his wealth, he may not understand the real nature of life as well as the fifteen-year-old farm boy who is in sympathy with the growing things around him.

There is a mystery about sympathetic contact with growing things that we do not pretend to understand. In a way in which neither scientists, philosophers nor sociologists can analyze, contact with growing things gives strength and sweetness to the character.

We fear that some of our readers wil be tempted to interrupt our rhapsody at this point to ask if contact between a cow's foot and a milk pail tends to sweeten and strengthen the character of the growing boy. Certainly! A boy who really has an affection for animals can soon cure most kicking cows.

At one time in our life we called up in our mind's eye all the millions and millions of farmers toiling in this world. They were working so hard—ten, twelve and fourteen hours a day, most of them. And for all their hard labor they were getting a mere living. It seemed to us that truly there was a better way. "Why should men labor like that when they might make food directly from the air, by means of the sun's rays without the aid of plants?" was the thought that came to our minds, and we knew that there was a possibility that some day such a thing might be done. If completely sucessful, it would put the farmer out of business. Nevertheless, there was a time when we ourselves wanted to make such a discovery. We are wondering now if such a discovery really would do any good. It would mean that people could live with much less labor than they are now living with. Probably men could live by working only two or three hours a day. We fear the results would be bad, for then all men would become more like the city men of today. They would have become dealers in things rather than dealers in life. We are afraid of that day when men know so much that they can get along by dealing with things and not by being in sympathy with life. It is for that reason that we hope that a large part of our population will always live on the farm. It is not a showy thing to live on the farm. The individual farmer is not big in the eye of the world. His sons may perhaps cut a big figure, but it is only after they have left the farm.

We are not pleading for a quiet vegetable existence. We are questioning the value of much of our civilization. We are not decrying the wonderful things accomplished by science, nor are we overlooking the splendid results secured by business management and cooperative organization and scientific direction. We are insisting that farmers must not only have these things, but they must have the one thing more—sympathy with the life around them.

Perhaps some day when the human race has had branded upon it a comprehension of the value of sympathy with life as well as understanding of things, it will be well for that greatest discovery to be made — the discovery of the secret of the plant, how it is that the energy of the sun's rays is imprisoned in the form of food.

No stooping to attend this oven. No aching backs. No risk of accidents in lifting heavy dishes in and out of the oven.

The baking is always in sight, and at the right height to avoid stooping. Think of the time this glass door will save!

Lovely white tile or porcelain enamel lines the cooking top. How easy to wipe off grease or stain!

Burns either Coal or Wood and has a HIGH OVEN

DID you ever expect to see such a convenient, labor-saving range?

Think of the days and days you would have liked to have the oven where you could reach it without stooping. Now, with the

LIGHTER DAY RANGE

you simply open the door and slide in the baking pans, without danger of spilling the dishes, and without tiring your back, because the Lighter Day Oven is at standing height.

You can read the thermometer without stooping. You watch the baking through the glass door — a glance is all, because you never have to stoop to look into the oven. Wouldn't this *Lighter Day Range* make a wonderful difference in your baking days?

New Ideas to Lighten Work.

The warming closet is directly above the oven; you do not reach over steaming kettles. The warming closet is heated like a second oven.

Large storage well up off the floor - for pots and pans.

Clear sweeping space under the whole range.

Two inside pot-holes for keeping odors of cooking from escaping through the house.

Extra long fire-box for burning wood The Lighter Day may be changed from a coal to a wood range in a few moments. The fire-box will take sticks as long as 26 inches.

New heating principle The Lighter Day Range uses all the heat from the moment the fire is started. The oven heats very quickly and economically.

READ THIS GUARANTEE

In the fifty years we have been making ranges we have never expected a woman to keep one that did not give perfect satisfaction. We guarantee THE LIGHTER DAY High-Oven RANGE unconditionally.

CLARE BROS. & CO., Limited
Makers of Hecla Furnaces
PRESTON :: ONTARIO

LIGHTER DAY
HIGH OVEN RANGE
For Coal or Wood

HAVE YOU SEEN IT?

The wonderful new range. The coal and wood range with a **High Oven!**

Every day more stores are ordering Lighter Day Ranges. If your dealer does not sell them ask him to order one. He will supply you with this range if he values your custom.

But you needn't wait until the range is on sale in your town. Let us send you the pictures our photographer took of the range in use. They show clearly how to lighten work in the kitchen. They are bound into a little Booklet that will prove very, very interesting.

Just tear out the coupon and mail it to-day.

COUPON

Clare Bros. & Co., Ltd,
Preston.

Send free "A Lighter Day in the Kitchen."

. . . .
. . . . .
. . . .

J.A.

When the human race has accomplished this last invention, it must learn to steer this planet of ours to some other solar system, in search of new worlds to conquer.

Wallaces' Farmer

WISCONSIN BANKS DO ACCOUNTING FOR FARMERS

"THE Wisconsin Farm Contest has emphasized the necessity of some simple yet accurate method of keeping accounts. Farmer after farmer has asked for assistance along this line. The work of keeping financial records can be greatly reduced by utilizing machinery offered by the banks".

This statement was recently made by D. H. Otis of the College of Agriculture in charge of the Farm Contest work. "Bankers, in many instances", he continued, "are recording all of the farmer's receipts in his bank book. This becomes an easy matter when the farmer makes out a suitable deposit slip indicating the source of the income. Both cash and checks can be handled in this way, and by depositing all income in this manner the farmer will have a record of all his receipts in his bank book.

"All expenses can be paid with checks, and the check will always serve as a receipt, and the stub as a record of the transaction. When it is desired to have a little change for incidental expenses, a check can be drawn for $5, and charged to miscellaneous, incidental, or personal expenses. If desired, a separate check book can be kept for family expenses.

"Many farmers are using farm account books, which contain the farm inventory, the credit accounts, and space for distributing the receipts and expenses. To insure accuracy, and to save time these books should be as simple as possible, and so arranged as to require the minimum of labor in adding, posting and summarizing".

IMPROVEMENT OF WOOL CLIP

Present and Future Effects of Agitation for Better Prepared Wool

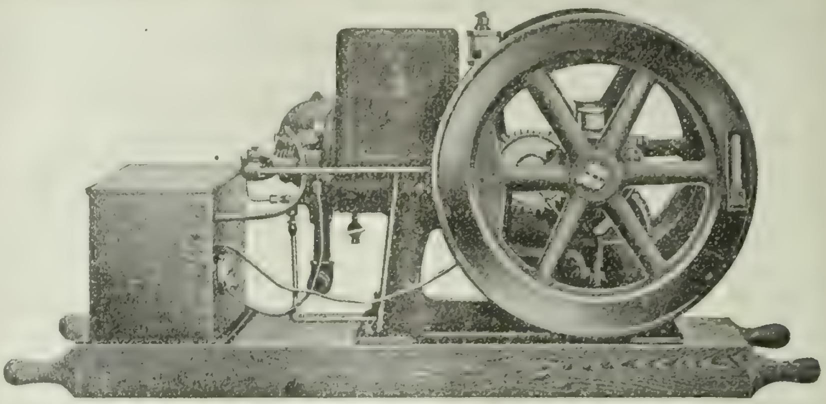
READERS of the agricultural press have noticed during the past few months numerous articles advocating better preparation of the domestic wool clip. Strange to say, most of these articles, and the discussions following them, have dealt primarily with the increased price per pound that the wool grower is expected to receive for his wool. There have been some differences of opinion upon this subject, some maintaining that a material increase in the price of wool on the ranch will result, while others hold that the increase in price will be largely offset by the increased labor cost of preparation. Where sufficient sheep can be shorn at one shed and where the better-prepared wool sells on its actual merits, financial benefit should undoubtedly accrue to the grower. However, limiting the discussion to the immediate profit of the producer has caused many readers to lose sight of a larger benefit that will eventually be brought about by properly constructed and properly operated shearing sheds—the more careful breeding of American flocks.

Up-to-date handling of wool upon the ranch requires men with a considerable knowledge on the subject, and the sheepmen for the first time will have access to this first-hand information. Formerly about all that the average sheepman knew about his wool was that it was wool. This is still largely the case, but now the better-informed ones are occasionally heard to talk about staple and clothing, fine and quarter-blood, shrinkage, etc. Their interest is gradually being aroused, especially in the States where grading and baling was started this last season, and when this is fully accomplished the greatest progress the industry has experienced may be expected.

One desirable condition remains to be fulfilled. Of the clips that have been graded or classed—that is, divided into lots of similar quality, condition, length, and money value—many have been offered for sale as a whole. Where the clip is sold as a unit the sheepmen do not fully recognize the difference in value between the different grades or classes of wool. If these different grades could be sold separately in the case of large clips, and interlotted in the case of small clips, so that only fine staple, quarter-blood, or whatever it might be, would be offered for sale alone, it would soon become apparent to the sheepman which was the most profitable wool for him to produce, and he would select his ewes and rams accordingly. He would then knowingly try to produce this character of wool, or as near it as possible (which in the past has resulted more from accident than from design), upon ewes producing the character of lamb he desires.

There are few places in the United States, even in the West, where wool is of as much importance as the lamb end of the sheep industry, but this is no argument against realizing as much as possible from that very important product. — *Weekly News Letter, U. S. Dept. Agr.*

The average annual value of principal farm products carried in international trade, that is, the total exports from all countries or imports into all countries, is estimated, for cotton $1,127,000,000; wheat and flour, $774,000,000; raw wool, $480,000,000; hides and skins, $392,000,000; coffee, $386,000,000; sugar, $382,000,000; rice, $278,000,000; barley and malt, $220,000,000; corn and meal, $210,000,000; unmanufactured tobacco, $192,000,000; butter, $173,000,000; tea, $143,000,000; rye and flour, $125,000,000, and oats, $102,000,000.—*Monthly Crop Report, U. S. Dept. Agr., July 15, 1915.*



PAGE ENGINES

--"as good as the fence you know is best"--

Farm Drudgery Stops when you install a Page.

THE modern up-to-date farmer uses his head more and his muscles less — and makes more money through the change in methods.

NO labor-saving device equals the value of a reliable, always-ready gasoline Engine. With it all the old bug-a-boos of farm-drudgery are banished to the past. For it pumps the water, runs the threshing machine, operates the churn, cream separator, corn cutter—grind stone, washing machine and every other labor maker on the farm. Without a good engine you can't compete successfully with more up-to-date neighbors. For you'll either have to keep more help than they do or work so hard yourself that life won't be worth living. No gasoline engine offers quite the same degree of reliability, economy and all-round usefulness as the PAGE. This sturdy engine is built in several sizes—from 1½ H.P. to 6 H.P.

ITS reliability is proven by the hundreds of letters from satisfied users. Send for copies of these letters.

ITS economy is guaranteed by the simplicity of its construction — there is nothing to get out of order — and by the unusually low consumption of gasoline. Its all-round utility is indicated in a circular describing the different sizes which we want to send you. Please send us your name and address on a post-card — and ask for the Page Engine Folders.

Write to-day.

PAGE WIRE FENCE CO.
LIMITED
Dept. 9
505 NOTRE-DAME WEST,
MONTREAL, - - - - P. Q.

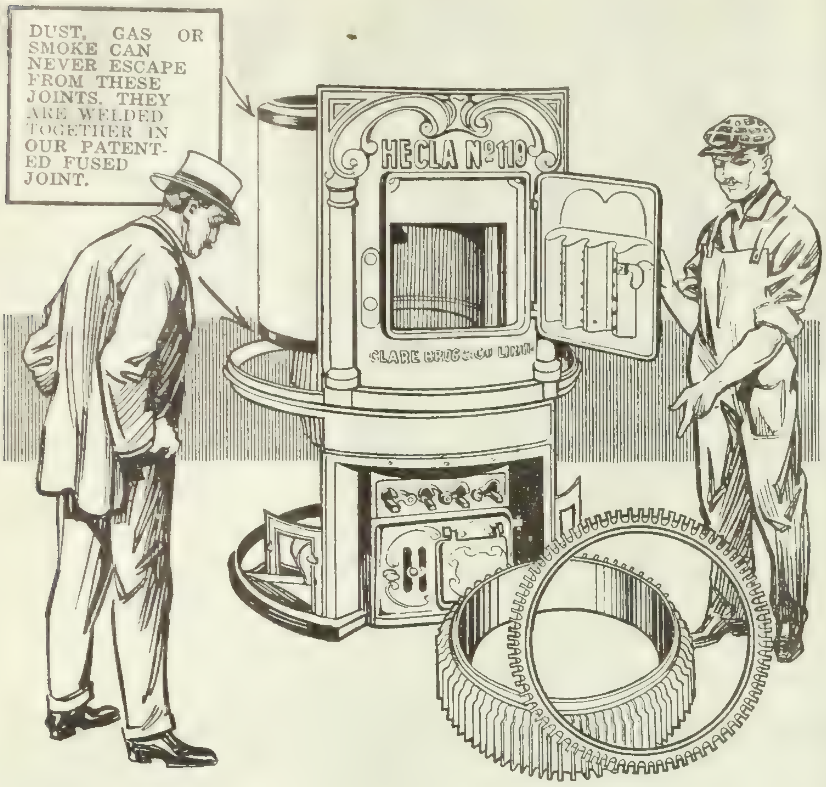
The JOURNAL of AGRICULTURE

AND HORTICULTURE

Volume 19 November 1st 1915 Number 5

"WHEN THE FROST IS ON THE PUMPKIN, AND THE CORN IS IN THE SHOCK"

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.


DUST, GAS OR SMOKE CAN NEVER ESCAPE FROM THESE JOINTS. THEY ARE WELDED TOGETHER IN OUR PATENTED FUSED JOINT.
HECLA No 119
CLARE BROS & CO LIMITED

"This Fire-Pot Saves Tons of Coal"

THAT is because it delivers heat quickly. All around it steel ribs are welded into the casting. They give the pot three times the ordinary heating surface. They draw out the heat from the burning wood or coal and send it on to heat the house. They save the heat for you instead of driving it out the chimney. In actual tests that saving amounts to one ton in every seven. NO other furnace has this coal-saving Fire-Pot. NO other furnace can give thorough heating from as little fuel.

Think of this when you order your furnace. Think of the economy year after year that Hecla owners are able to make.

Mellow Air Free From Dust, Gas and Smoke

No matter how long you use a Hecla Furnace, gas or dust can never escape from the fire into the warm air that heats your house. We guarantee this for the life of the furnace. And your Hecla supplies mellow, healthful heat. Never that dry heat that is so oppressive. The Hecla provides moisture in plenty.

HECLA WARM AIR FURNACE

Before deciding on a furnace you should read our little booklet, "Comfort and Health." You can learn from it many valuable points about heating. If you wish definite plans and quotations, you are free to command them from our heating experts.

Send the coupon for the Booklet to-day, or write for free advice on any heating problem.

Clare Bros. & Co. Limited, Preston

Send Free "COMFORT & HEALTH"

. . . .

. . . .

J.A.

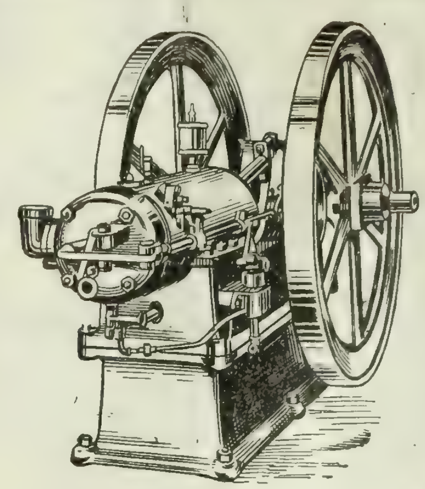
$120.00 turned this pretty 9-roomed house of Mrs. Jacob Sadler's, Heidelberg, Ont., into a cosy home. Burned only 3 tons of coal last winter.

L. B. Stouffer, Plattsville, heats this large house with a Hecla that cost only $160.00 to install. He gets summer comfort for 7 tons of coal.

A. E. Ball's residence at Hanover, Ont. It cost just $115.00 to install a Hecla, and less than six tons of coal keeps the house comfortable all winter.

This large residence at Roseville was fitted with a Hecla Furnace at a cost of $105.00. N. B. Bricker, the owner, says he keeps it cosy with 3½ tons of coal.

J. D. Moore, County Registrar, North Dumfries, heats this 12-roomed home with 7 tons of coal. $160.00 paid for the Hecla Furnace complete.

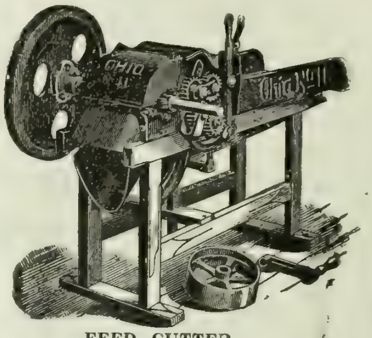


FARMER'S LABOR SAVER

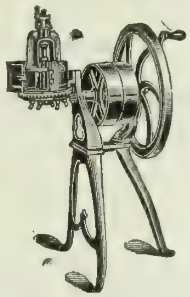
"STOVER" and "MILWAUKEE"

Are some engines, who work when needed. Stationary and portable styles. Write for particulars.

Feed-cutters, Root pulper and slicers, clover cutter, corn sheller, cider mill, always in stock for immediate delivery.



FEED CUTTER



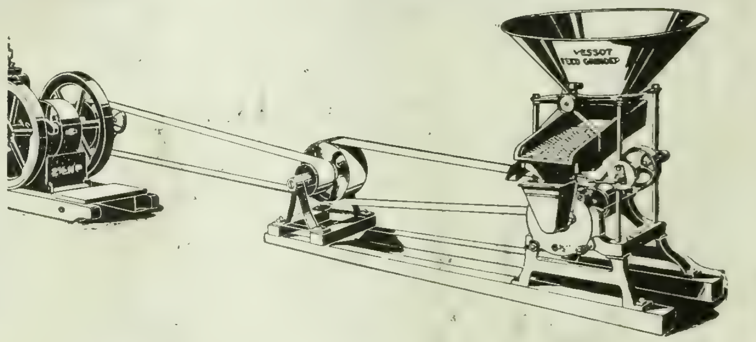
GREEN BONE CUTTER

This machine is very much appreciated by the poultry farm owner and is regarded as a good investment.

Moderate prices. Easy terms.

CATALOGUE ON REQUEST.

P. T. LEGARE
LIMITED
273 St. Paul Street, - QUEBEC



Vessot Feed Grinders

WHAT better recommendation than this could a feed grinder have—"It grinds flax, barley, corn, crushed ear corn, oats, wheat, rye, peas, buckwheat, screenings of any kind of mixed grain or any other feed stuff, fine or coarse as desired, and removes foreign substances."

"It grinds all feed stuff"—because of its excellent grinding plates. So well known are the original **Vessot** plates, and so highly regarded by all who know them, that imitations are appearing. To insure our customers getting genuine plates, we have arranged to have the trade-mark, "**S. V.**", placed on every genuine **Vessot** plate so plainly that you cannot go wrong. Look for the "**S. V.**"

Vessot grinding plates do their work so uniformly well that a clean, satisfactory job is assured. The two-sieve spout removes all foreign matter, from nails and stones to dust and sand. One caution only—use steady, reliable power to drive a **Vessot** grinder, such power as is furnished by an **International Harvester** oil engine—**Mogul** or **Titan.**

Buy a **Vessot** feed grinder in the size best suited to your work and a **Mogul** or **Titan** oil engine to run it.

See the I H C local dealer, or write to the nearest branch house for full information.

International Harvester Company of Canada, Ltd.
BRANCH HOUSES
At Brandon, Calgary, Edmonton, Estevan, Hamilton, Lethbridge, London, Montreal, N. Battleford, Ottawa, Quebec, Regina, Saskatoon, St. John, Winnipeg, Yorkton

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 96,987
ENGLISH, 9,820
FRENCH, 87,167

Volume 19
NOVEMBER 1st 1915
Number 5

EDITORIAL

NOTICE RE FARMERS' CLUBS

An Act to amend the Revised Statutes, 1909, relating to farmers' clubs

HIS MAJESTY, with the advice and consent of the Legislative Council and of the Legislative Assembly of Quebec, enacts as follows:

1. Article 1872 of the Revised Statutes, 1909, amended by replacing the word "December" in the second line thereof, by the word *"January."*

2. Article 1874 of the said statutes is replaced by the following:

"1874. At such meeting the members who have paid their subscriptions for the current year at least one hour before the opening of the meeting, shall elect seven directors from among themselves, and appoint an auditor.

To be entitled to vote at such election, a member must be at least 16 years of age".

3. Article 1884 of the said statutes is amended by replacing the word "January" in the seventh line thereof, by the word "February".

4. Article 1885 of the said statutes is amended by replacing the word "February" in the fourth line thereof, by the word "March".

5. This act shall come into force on the day of its sanction.

ST. VALIER ABATTOIR SCHOOL

Notice to Farmers' Sons

FARMERS' sons who desire to qualify in the manufacture of bacon and the preparation of smoked meats are invited to take a course which will be given at the St. Valier Abattoir School, Bellechasse county. These courses will be given free of charge; students are only required to pay their board.

Application for admission should be sent to the Hon. J. Edward Caron, Minister of Agriculture, Quebec.

BEWARE THE PROMOTER !

PASTED under the glass of the cigar show case in a hotel in one of the smaller towns of the province we noticed a definition of a promoter which ran somewhat as follows :

"A promoter is a feller as kin sell a thing as don't exist to a feller as don't want it".

This is a good definition and one that suggests the persuasive powers that are a necessary part of the equipment of the promoter. At this very hotel there were pointed out to us a brace of promoters who, we were assured, had succeeded in extracting as much as three thousand dollars out of some of the farmers of the surrounding country in payment for stock in a projected manufacturing company. The company was to make filters for removing poisons from water. That the filters could do what was claimed for them was demonstrated by putting poison into some water, filtering it and proving that the poison had been removed. Just what advantage there is in removing poison from water known to contain it rather than abstaining from drinking such water was not clear to our unenlightened eye. But no doubt the promoter could have made the matter plain—or at least plausible.

Possibly in speaking of their project at second or third hand we may be doing these two persuasive personages some injustice. The business they were promoting may have been a legitimate and reasonable one. But our point is this: What business had a farmer to buy stock in a company carrying on an enterprise of which he can have so little knowledge? The farmer has a business of his own, a business he understands more or less thoroughly and a business that, as a rule, pays better the better it is capitalised. The farmer who cannot find a good use for his extra money right on his own farm is a rare one. Is his farm underdrained? Is it well fenced? Has it a proper equipment of buildings? Has it a satisfactory water system? Has it the best possible classes of live stock? Has it all the stock it will support? Has it an adequate supply of machinery? Is it large enough to be worked to the best advantage? Has it a residence for a hired man? There are a thousand and one ways in which the farm investment may be increased and many of them would pay handsomely.

But supposing the farmer has his business in such good condition that further investment will not be profitable? Even then we should say "Beware the promoter!" Barring a life insurance and investment on his own farm, the wisest investment for a farmer is, in our opinion, an investment in the farm of a neighbor. Let him lend his excess of capital to a neighbor, taking proper security, such as a mortgage. He thus puts his money into the hands of one he knows to be honest, reliable, hardworking and a good manager. He knows what his money is being used for and can judge intelligently whether it is being wisely used. If he puts it into a stock company carrying on a business which is foreign to his experience he loses all control over it and it will be remarkable if he is given any satisfactory information about the way in which it is being used.

The same thing—that is to say, investment in one's neighbors' farms—can be done in a broader and more flexible way by means of a co-operative credit society. We hope to see the day when such societies will be the rule in all our rural communities. They afford a means of conservative investment for the excess capital of farmers and are a great convenience to the younger and more enterprising members of the community. They are working well among our French-Canadian neighbors. Why do not the English-speaking farmers make use of the same methods?

In any event, beware of the promoter !

TWENTY-FIFTH ANNIVERSARY OF THE AGRICULTURAL MERIT COMPETITION

THE official celebration of the 25th anniversary of the Agricultural Merit Competition was held at Quebec in the Provincial Exhibition grounds on September 1st. Several hundreds of those who have received the decorations or diplomas during the quarter-century registered in the Palace of Industry, where they received a souvenir medal entitling them to admission to the banquet given in their honor in the evening. At eleven o'clock the laureates of 1914 and 1915 were decorated by the Lieutenant-Governor, the Hon. E. Leblanc in presence of the Minister of Agriculture, the Hon. J. Ed. Caron, and of over 300 of those who had received similar decorations in preceding years. To commemorate this important occasion, a great flag-pole was planted in the centre of the grounds by the Lieutenant-Governor.

At the banquet held in the evening the Hon. Cyrille Delage, Speaker of the Legislative Assembly and President of the Provincial Exposition Commission presided and addresses were delivered by Sir Lomer Gouin, Premier, by D. O. Lesperance, M.P., representing the Hon. Martin Burrell who was unavoidably absent, by the Hon. J.-Ed. Caron, by M. Levesque, member for Laval, by Ald. Cannon of the City of Quebec, by the Hon. J. Decarie, Provincial Secretary, by Messrs. Damase Potvin and A.L. Gareau and by three gold medallists of the Order of Agricultural Merit, viz. Messrs. Robert Ness of Howick, Wilfrid Simard of St. Gideon, Lake St. John, and Joseph Couture of Jeune-Lorette.

Sir Lomer Gouin rendered homage to the memory of Col. Rhodes who had been the first to think of endowing the province with this order of Agricultural Merit, of Sir Henri Joly de Lotbinière, one of the prominent apostles of colonization, of Mgr. Labelle the priest-colonizer, and of Mercier, the true founder of the Agricultural Merit. He recalled the majestic ceremonies accompanying the decoration of the first twenty-eight winners of the competition, twenty-five years ago. This occasion, he said, was, however, not merely one of retrospect; it was also one of hope, "for in decorating the tillers of the soil, you give hope to the young". He adjured the farmers to commend their profession to their sons and to keep for their children the cradle which had been their own and the home which was that of their fathers. He recalled with emotion the ceremony held in Laval University during the celebration of the Tercentenary of Quebec, when the representatives of the old families of farmers, who had remained rooted to the soil for two centuries or more, were specially honored in the presence of the Prince of Wales, now our Sovereign, and of representatives of the British House of Lords, of France and of the neighboring republic. Agriculture was honored and appreciated, he said, and our sons should be taught to love and respect the soil.

CONTENTS

EDITORIAL.—Notice re Farmers' Clubs.—St. Valier Abattoir School. — Beware the Promoter.—The Twenty-fifth Aniversary of the Agricultural Merit Competition. — A Rural Leader gone.—School Fairs.—The Work of the County Demonstrators.—The Farmer's Meat Supply.—Notes on our Neighbors.

GARDEN AND ORCHARD. — Death of the Rev. H. A. Dickson, Rectory Hill, Megantic. —Summer Meeting of the Quebec Pomological Society. Storing Cabbage in the Field.—Late Fall Notes.—Seasonable Hints on Floriculture.—Care of Rubber Plants.—Fire Blight.

FARM AND FARM CROPS. — Sherbrooke County School Fair.—School Fairs in the District of Bedford.—Shawville Exhibition.Notice re Eleventh Annual Report C.S.G.A. A new and Valuable Stock Feed.—The Importance of Grain Screenings.

LIVE STOCK.—Some Observations as to Quantity and Quality of Milk.—A leader in Richmond County.—An Experiment in feeding Commercial Grain Screenings.—Some Flocks, Herds and Farms of the Bedford District.

DAIRY. — St. Hyacinthe Dairy School Winter Course.—Milk.—The Ayrshire in her native Home.

POULTRY. — Poultry required. — Health of Fowls. — Housing the Laying Stock. — Poultry at the Rural School Fairs.

WOMAN'S WORLD.—Foods and Food Preparation.—Carpet Beetle.—Ridding a House of Fleas.

GENERAL INTEREST:—The Hessian fly in the West.—Forage Plant Tests.—Losses of Potash from the Manure Heap.—Silage Acid.—Drainage Questions and Answers.—Winter Dairying.—What is it to be a Scientific Farmer?—Pork Production.—Fish Scrap as Fertiliser.—Rat Destruction.—Agriculture in the School.—The Cost of Weeds.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

To save a few seconds time by beating the train at the crossing has lost many a life.

It has been announced ("New Statesman", London), that no fewer than 19,648 boys trained in reformatories have served in the war since August, 1914. Three of them have won the Victoria Cross, twenty-five have earned the Dintinguished Conduct Medal, twenty have been mentioned in despatches, and three have obtained commissions.

The Hon. J. Ed. Caron paid an eloquent tribute to the memory of the late Hon. Honoré Mercier, to whom we owe the institution of this fine competition, "Providence has willed that the work of Mercier, a work so great and so beautiful, should be continued by two of his relatives, our Prime Minister, Sir Lomer Gouin, and his son the Hon. Honoré Mercier, to-day Minister of Colonization, Mines and Fisheries. This was the life work of Mercier, a work which deserves our sincere thanks and our deepest gratitude".

The Hon. Mr. Caron gave statistics demonstrating the great progress which has been made in the agriculture of the Province of Quebec, particularly in the last decade. The values of farms and of flocks and the fertility of the soil had increased greatly and the farmer's income had grown accordingly. The farmer's income had doubled, and this was in great part due to the happy influence of the laureates of the Agricultural Merit. "The good work", said Mr. Caron, "the work which counts, is that work of the hands, the work of those of the order of Agricultural Merit, the farmer". He referred also to the work of the agricultural colleges, the Agricultural Institute at Oka, the School of Agriculture at Ste. Anne de la Pocatière, both of which had been forced to increase and more than double their accomodation for students, and Macdonald College.

He referred to his happy days on the farm and announced that when the fortunes of politics should cast him from his seat, his first step would be towards the ancestral soil, where he would again take up the plough. He spoke also of the housekeeping schools of the province and of the short courses by means of which agricultural instruction is brought to the door of the well-disposed farmer.

In closing he appealed to all authorities, whether religious or civil, and to all professions to assist the movement already commenced and asked the prime minister to continue his favors and encouragements to the agricultural class. As his last word he expressed his confidence in the future, his confidence in the success of the allied armies, to which the wheat of the Dominion, he was sure, would afford the final victory.

A RURAL LEADER GONE

FORTUNATE is the rural community that has a leader who helps the people to help themselves. Such a leader was the late Rev. H. A. Dickson of Rectory Hill, Megantic County, who died October 12th.

Three years ago we had occasion to discuss in these columns the question of the Rural Church in its relation to Community Life, and we attempted to point out the opportunities of the rural pastor for leadership in the material improvement of the people. It happens frequently that the only hope of bettering the spiritual condition of the people is to improve the material conditions in which they are living. Not naming the man, we said:

> "An efficient pastor should be able to relate himself to the common affairs and practices of the community in such a way that he can use them in helping the people. If he can be a leader in any agricultural pursuit his influence for good will be all the stronger.
>
> An instance of this kind of pastor comes to mind. He has charge of two churches and he is the foremost fruit grower of his district. He believes it to be his business to preach scientific apple-growing in his district where more apples should be grown, and his most impressive service has been to raise splendid crops of apples by proper attention to his trees. He has become the leader among the farmers for a better livelihood. On account of his good work he preaches better and more impressive sermons on Sundays."

We had in mind the Rev. H. A. Dickson of Rectory Hill, for we had visited his district and had seen some of the things he had done for the people.

The province can ill afford to lose such a man, for such leaders are rare. Mr. Dickson was solving the rural problem in his community by maintaining among his people a Christian civilization with high ideals of happiness, efficiency and progress. He saw that if a people were to be lifted up there must be toil directed by intelligence; there must be a satisfying environment, hence the need for orchards and gardens, good roads and conveniences for markets, good schools and churches, and community co-operation; and above all and bound up with all there must be the development of a strong religious sentiment embodying the highest possible ideals for personal and community life.

The rural communities need men who, like the late Mr. Dickson, "can see clearly the best and work for it with high enthusiasm long before it becomes an actuality."

It may be truly said of him that "He entered into their (his peoples') experiences, he breathed the same air of simplicity and freedom; he responded to the native elements of rural character, and he understood the rural mind."

SCHOOL FAIRS

THE School Fairs inaugurated and carried out last month by the Agricultural Demonstrators under the guidance of the School Inspectors were most successful, and deserve greater recognition by the educational authorities. A few months ago we pointed out in these columns one of the dangers which threaten school fairs—namely the rise of the purely commercial spirit of school exhibitions for the sake of the prizes. This danger, we are pleased to say, was not in evidence to any great extent in the fairs that have just been held.

There are other dangers, however, which must be guarded against inasmuch as they have loomed up in other places. These are:—

(1) The prizes may be out of proportion to the effort expended;

(2) The exhibits may not represent real effort on the part of the children;

(3) The children may be used to advertise or exploit the school or the persons concerned in instituting the fair; and

(4) The successful competitors may get an improper estimate of their own importance.

It can readily be recognized how dangers such as these might come into existence. Over-zealous promoters, ignorant of the essential function and nature of school fairs, might very easily do much harm. If, however, the educational, not the agricultural, work is kept strictly in view as the fundamental consideration, little harm and much good will be done. If it is borne in mind that the improvement of the farming of a region is only an indirect, nevertheless an important, function of the contest, and that the value of the contest lies primarily in the educative and cultural effect on the child, then school fairs may be made a most valuable agency in uplifting a community.

We believe that it is advisable to keep school fairs distinct from County fairs. They should be held, as was the case this year, in some convenient, central place, preferably a school, so that the whole attention of the parents and children may be directed to the work in hand.

Moreover, we believe that the work in connection with school fairs should be a part of the public school system with the growing of plants and the feeding of chicks etc., under the direction of the teachers. It may still be very necessary for the local demonstrators to give a helping hand, but the teachers should have direct oversight of the work done at home, supplemented where possible by work at school.

Rural Teachers who took the summer Course in Nature Study and Elementary Agriculture at Macdonald College.

THE WORK OF THE COUNTY DEMONSTRATORS

A few weeks ago the Macdonald College Agricultural Demonstrators met at the College to present reports of their season's work and to discuss plans for the future. It is very gratifying to learn of the success that has attended their efforts, and that these efforts are being appreciated by their constituents.

They are all busy men, and few persons are aware of the many undertakings they have in hand. Their main work may be said to be *organization*—the formation of clubs or societies along co-operative lines. Among these the egg circles and the wool growers' and sheep breeders' associations have been uniformly successful, and have brought home to the farmers the benefits of well conducted co-operative societies.

Much time, however, is devoted to other lines of work. They carry out demonstrations of various kinds in the growing of alfalfa, corn and roots; in the spraying of orchards and potatoes; in the prevention of smut in oats; and in drainage operations. Considerable time is devoted to the work of school fairs with the object of interesting the children in rearing chickens and growing crops and flowers according to instructions. Lectures and Short Courses of instruction are given in certain centres on agricultural topics that are of value and interest to farmers and farmers' sons.

In addition to all these, the Demonstrators give individual help to hundreds of enquirers regarding difficulties and problems that arise during the year. For example, help and advice are given in the construction of barns and silos, in the use of fertilizers, in the control of weeds and insects, in planning suitable crop rotations, etc. etc.

The Demonstrators are optimistic as to the importance of their work. They feel that their work has only just begun, and that as soon as the good will and co-operation of all the farmers can be secured the benefits will become more apparent. They realize, however, that progress must necessarily be slow, but they are cheered with the hope that sooner or later the inertia of indifference and prejudice to the introduction of more profitable and permanent practices will be overcome. This change is likely to come with the rising generation who are now becoming interested by means of the boys' and girls' clubs and by the increased attention that is being given to agriculture in the schools.

The following is a list of the Demonstrators, and the counties in which they are operating:—

J. K. King, B. S. A.,
Pontiac Co, Shawville, P. Q.
A. F. Emberley, B. S. A.
Stanstead Co., Ayer's Cliff, P. Q.
J. H. King, B. S. A.,
Compton Co., Cookshire, P. Q.
E. A. Lods, B. S. A.,
Bedford District, Cowansville, P. Q.
C. H. Hodge, B. S. A.
Richmond Co., Richmond, P. Q.
R. E. Husk, B. S. A.
Beauharnois District, Huntingdon, P. Q.
W. G. MacDougall, B. S. A.
Sherbrooke Co., Lennoxville, P. Q.
(to be appointed),
Argenteuil, Co., Lachute, P. Q.

THE FARMER'S MEAT SUPPLY

NOWADAYS many farmers are so much occupied with other matters that they depend on the itinerant butcher cart to bring them their supply of meat. They realize that this meat supply is an important item in the "high cost of living" but they do not realize that there are ways of avoiding contributing to the butcher's living and still getting as good meat as he can bring to them. Mr. Wilton Dryden of Cowansville is one of those who has successfully solved this problem and we take pleasure in quoting his account of his method:

"We now dress about 400 to 500 lbs. of pork, the favorite weight being about 175 lbs. The pork is killed as early as we feel sure of its keeping safe by freezing and packing in butter boxes to be kept in the oat-bin. But before packing we take out all the sides and hams. The trimmings we use for sausage, the clear or thick fat for salt pork. The bacon we cure in pickle for six weeks, using a thirty gallon crock (not barrel), then take out, cover with cloth and smoke with corn-cobs and bran. When warm weather comes, we set the crock of smoked meat on the concrete floor of the cellar, where it keeps good for all summer.

"For beef we keep a grade bull calf until from ten to thirteen months old. We have killed one at eleven months that dressed 391 lbs., meat and hide. I can assure you you do not need to hold your foot on a piece of that steak to get a bite loosened. When cooking portions of this beef for table use we put in some extra, boil down until no water remains, pack tight into quart or half-gallon fruit jars, having good rubbers, and fill up the jar with melted tallow, of which we get plenty from the beef itself. This is just as fresh in the middle of summer as when put up and it is fit for the King. Do not, however, delay the canning until the beef has frozen and thawed several times."

"Sausages can also be kept by cooking partially, placing in a small crock and covering with lard. Such sausage is a mighty sight better than what tumbles around in a meat cart all day, and you have the further advantage of knowing how many different kinds of animals are in it."

"With these kinds of meat, some poultry and eggs, a bone for soup, and some inexpensive fish, the man who complains should be sent to Germany. I get tired of hearing some people talk about the cost of meat when they are paying 22 to 25 cents for smoked meat they perhaps sold for 7 or 8 cents a few months before, or buying beef steak from some veteran cow that has voted in the last two general elections."

NOTES ON OUR NEIGHBORS

SINCE 1911 the Dairy Division of the Dominion Department of Agriculture has followed the policy of establishing dairy record centres. With an official of the Division permanently on the ground quicker and more definite results have been obtained in the improvement of dairy herds. Ontario now has 15 of these centres and the Maritime Provinces 9. Quebec has 10.

* * *

At the Toronto Exhibition some 7000 dozens of eggs were judged according to the standards for Canadian eggs established by the Poultry Division of the Federal Live Stock Branch.

* * *

The Dairy herds of the Ontario Industrial Farms, in connection with reformatories and hospitals for the insane, number from 380 to 400 cows. During the last three years the average gain in production per cow in these herds has been from 550 to 580 lbs. of milk per year.

* * *

According to Mr. R. H. Campbell, Director of the Forestry Branch of the Department of the Interior, nearly six per cent of the farm lands of Eastern Canada are occupied by wood lots. Under proper management these wood lots are capable of producing seven tenths of a cord per acre, or about four and one-fifth cords per hundred acres of farm land. The total production on this basis would be more than twenty times as much as the whole quantity of hardwood cut for saw timber in Canada in 1913.

* * *

Thirty years is placed as the limit of Ontario standing timber at the present rate of burning and cutting.

* * *

The value of the forest production in Canada in 1913 exceeded that of the wheat crop by nearly fifty million dollars.

* * *

Ontario bee-keepers are co-operating in a gift of money to the Red Cross Society.

* * *

Summer schools for teachers were held this year in all the provinces of the Dominion. Nature Study and agricultural science occupied a prominent position in the courses given in these schools. These courses will no doubt give a great impetus to the improvement of the rural schools of the country.

* * *

Agricultural demonstration cars are being run over the lines of the Canadian Pacific Railway in Ontario, October 4th to November 5th. The staff of instructors is drawn from the agricultural college, the Department of Agriculture and the Farmers' Institute staff.

THE GARDEN AND ORCHARD

DEATH OF THE REV. H. A. DICKSON, RECTORY HILL, MEGANTIC

WITH the death of the Rev. H. A. Dickson, M. A., rector of St. Stephen's Church, Rectory Hill, on the 2nd October not only Megantic County but the whole province suffers a severe loss.

For many years Mr. Dickson has taken a prominent part in horticultural operations and has shown himself to be one of the best informed men in apple growing in the province.

Mr. Dickson was born at Trenholm, Drummond County, October 21st 1867, and was educated at St. Francis College, Richmond, and at Bishop's College, Lennoxville, from which he graduated in 1889 with honors. In September of the same year he entered for the Divinity course at Bishop's and was ordained deacon in June 1891, being appointed to the mission of Newport where he had four stations—Randboro', Island Brook, Learned Plain and Clifton. A year later he took the degree of M.A. and in September 1894 he attended the General Theological Seminary, New York, taking a post graduate course. In 1895 he was sent by the late Bishop Dunn to the mission of Inverness where for the past twenty years he has worked for the welfare of the people of this community. In 1908 he was chosen Rural Dean of Levis.

Mr. Dickson was a man who believed that the pastor's week-day duty is not confined to mere empty formalities. He considered that one of his chief duties was to elevate and to improve the conditions of his fellow men. Accordingly he took a deep interest in all matters that concerned his people. One of the first reforms that he effected in his district was the restoration and beautifying of rural cemeteries; the cemetery at Rectory Hill is a standing monument to his thoughtfulness and his care.

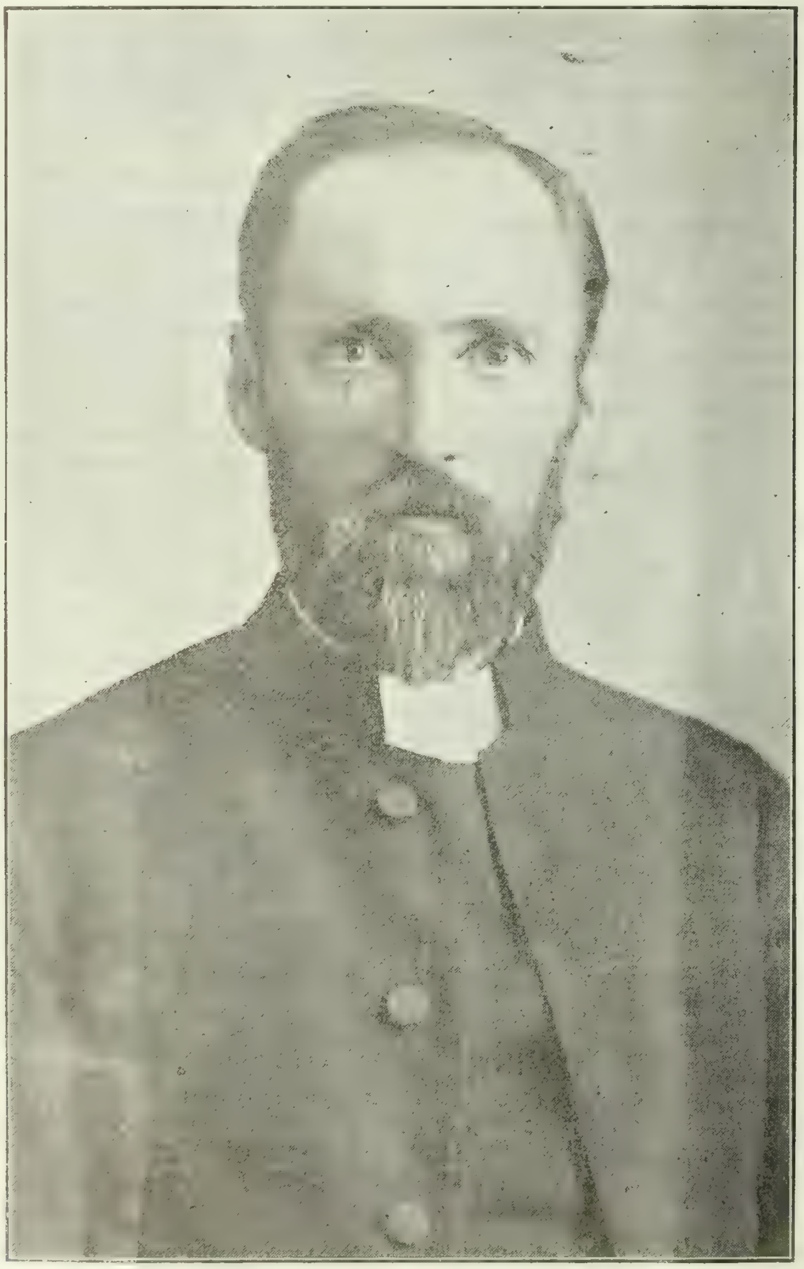
In 1906 he organized the Inverness Horticultural Society through whose influence the people have been stimulated to improve their orchards and gardens and to beautify their home surroundings generally. In 1910 he started an agitation for a People's Telephone for the County of Megantic and was so successful in his persistent efforts that the project is an accomplished fact to-day and rural Megantic has a telephone system with a service costing less than any public telephone system in the province, and it brings the people into business and social communication not only with the surrounding counties but also with the Eastern Townships, Montreal, Quebec and the Eastern States.

For many years Mr. Dickson was an active member and a Director of the Pomological Society of Quebec. About four years ago he was honored with the highest position in the Society by being appointed its President. He has frequently acted as a delegate to interprovincial and Dominion meetings of horticulturists. His discussions of horticultural problems at the annual meetings of the Society were always to the point, moreover every person felt that a practical orchardist was giving his experience.

Mr. Dickson preached his last sermon on Sunday 5th September, and on the 5th October Bishop Williams preached his funeral sermon from the words "The souls of the righteous are in the hands of God." On the 6th October he was laid to rest in the beautiful cemetery at Kirkdale, near his old home.

Mr. Dickson leaves a wife and five children. He was married in September 1891 to Miss Ruth Stevens, of Kirkdale. The children are George, who is taking a course in horticulture at Macdonald College; Russell, studying medicine at McGill; Eva and Hilda attending St. Helen's School, Dunham; and Ethel at home.

The *Journal of Agriculture* extends its sympathy to Mrs. Dickson and family in their bereavement. It takes this opportunity, although a little late, of acknowledging many kindnesses received at the hands of Mr. Dickson for many years while endeavoring to improve the fruit conditions of this province.



The late Rev. H. A. Dickson, M.A., Rural Dean of Levis and Rector of St. Stephens at Rectory Hill, Mégantic Co.

SUMMER MEETING OF THE QUEBEC POMOLOGICAL SOCIETY

THE annual Summer Meeting of the Pomological and Fruit Growing Society of the Province of Quebec was held this year at Ste. Anne de la Pocatière, Kamouraska County, and proved to be a great success. There were three sessions held at which there was a good turn out of the people interested in the Society and the objects of the Society, but as heretofore when our meetings were held in conjunction with neighborhood exhibitions, we found that the time of the people was taken up more with the displaying of their exhibits and the receiving of their rewards than in the papers and addresses which had been so carefully prepared for their edification.

The first session was held on Wednesday, September 23rd in the afternoon and was followed by an evening and a morning session on Thursday. At the opening session Mr. Rousseau, of Acton Vale, the President for this year, spoke of the work that the Society was endeavoring to do for the Fruit Growers of the Province and mentioned the good work that Mr. J. C. Chapais, of St. Denis, had done for Eastern Quebec by his pioneer work in fruit culture and the very careful and methodical experiments that he has carried on for nearly a quarter of a century, and which he has made public to the great number of interested growers of the province by articles in the farm and horticultural journals and also by the addresses that he has given to the members of the Pomological Society.

The work of Mr. Auguste Dupuis was also spoken of and the great value of his experiments and reports from the Fruit Station at Village des Aulnaies, of which he is the Director. Both these gentlemen are amongst the oldest members of the Society.

Mr. Rousseau also thanked Rev. Mr. Pelletier, director of the College at Ste. Anne, for the kind invitation that he had extended to the Society and for the good work that was being done by the College for the youth of the surrounding districts.

The Rev. Mr. Pelletier followed with a very kind address of welcome, assuring the delegates of the pleasure and profit of having them at the college and expresssing the hope that they would return at an early date.

Summer Meeting of the Pomological Society at Ste. Anne de la Pocatière.
Left to right:—Rev. Father Leopold, Messrs G. P. Hitchcock, R. A. Rousseau, Robert Brodie, J. C. Chapais, Auguste Dupuis. Also present Messrs Solyme Roy, Peter Reid, Rev. Noel Pelletier, Rev. H. Bois and several other members of the Pomological Society.

Mr. Robert Brodie followed this address with a paper on "A Trip to the Fruit Districts of British Columbia" after which Prof. P. Roy of La Trappe gave a paper on "A Trip to the Niagara District". These two papers were of a very interesting character showing the impression made on Quebec Fruit growers by the great extent and mode of cultivation of these very noted districts.

In the absence of Mr. Chas A. Slack of Abbotsford, the Rev. Father Leopold read the paper prepared by Mr. Slack for the meetings, on "Home Made Lime Sulphur and Results Obtained". Father Leopold also answered any questions which were asked on the subject of the paper.

This brought the afternoon session to a close, and the evening meeting opened with a paper on "Recent Introductions of a Few Foreign Fruits into Quebec" by Mr. J. C. Chapais, who told with what success he had met in introducing into Kamouraska County, apples, plums and pears of European origin. The success that Mr. Chapais has achieved is marvellous, and shows the influence that the open body of water must have on the climate in this region. The remainder of the evening was taken up by an address by the Rev. Father Leopold, who illustrated his address by means of lantern slides. His lecture started with a view of La Trappe and then followed pictures of well known fruit men after which the Rev. Father started at the nursery and continued through all the operations of the well kept orchard, showing cultivation in different places of the province, spraying operations, pruning and gathering of the fruit.

Owing to great pressure of business the Hon. Mr. Caron was unable to take part in the programme as he had intended, but the following day he spoke to the combined meetings of the Horticultural Societies of the Counties of L'Islet and Kamouraska, at which meeting the Hon. Mr. LeBlanc was also present.

The following morning, Thursday, there were two very good papers delivered, one by Prof. Levasseur of Ste. Anne and the other by Prof. Ponton of La Trappe. Both these papers dealt very concisely with their subjects. Mr. Levasseur dealt with the cultivation of the Native Plums and held that it was better for the grower to use the tried varieties, while Mr. Ponton gave a detailed account of the treatment of soil and other operations to secure the best results.

The address was then brought to a close by a stirring appeal for a closer union of the French and English Colleges and for an interchange of the best that is in these colleges.

The Rev. Father Leopold thanked the people of Ste. Anne and the officers of the College for their very kind entertainment of the delegates, and was followed by Mr. Robert Brodie who also felicitated the authorities on their college and the vast improvements since he had last visited it.

With a few words of thanks the president brought the meetings to a close. In the afternoon a number of the delegates visited the new Experimental Farm of the Dominion Government, and were very pleased with the results so far obtained.

PETER REID,

Secretary-Treasurer

STORING CABBAGE IN THE FIELD

IN choosing a site for a storage pit, select a ridge, well drained and as gravelly a soil as possible. The pit should be 6 to 10 inches deep, the length and width depending upon the amount to be stored. It is well to have it wide enough to accommodate 3 to 5 heads on the bottom row.

In harvesting the heads, pull up by the roots. Break off only the dead or diseased leaves, and fold the remaining leaves over the head as much as possible to protect them. Overripe or cracked heads should not be stored. The heads are placed in the pit with their heads down and roots up. The second layer is also placed heads down between the roots of the first layer. It is well not to have more than two layers, on account of the weight having a tendency to crush the lower layer.

When the cabbages are put in place they are covered with a layer of earth. When cold weather comes, straw or manure can be added.

Cabbages can often be kept better in pits than in common cellars.—E.

LATE FALL NOTES

HAS any preparation been made to keep birds about the place this winter? Birds should be fed when there is heavy snow or at other times when food is scarce. There is a good old Scandinavian custom, which might be followed here with pleasure and profit, of putting a sheaf of wheat out occasionally during the winter to feed the birds. Try it. The fun of watching the birds will pay for the trouble.

Have you noticed the bright fruit on the different viburnum bushes, such as the black haw, highbush cranberry, and Viburnum lantana? The viburnums are worth growing for their autumn fruit and coloring.

Fine specimens of dahlias and gladioli in all colors were abundant this year. These two plants deserve to be planted in greater variety than they usually are. They furnish an excellent fall flower for all sorts of purposes.

Is the entrance to your home attractive? Things that are always noticed in the country are entrances to farmsteads. These should at least be clean, orderly, and well laid out. The lawn is more pleasing if it is kept clipped and if it contains a few shrubs and trees.

In the war against farm and garden pests a fall clean-up is a good means of attack. Fall plowing is generally recognized as a good method for the prevention of insect injury, but rubbish left in piles along fences, or in fence corners, or in the orchard or kitchen garden, make the best kind of winter quarters for insect pests in various stages. Trash of this kind should be cleared away, preferably by burning, as such burning destroys any insects among the rubbish.

For late-winter flowers hyacinths should be planted this month.

It is safer to plant all ornamental shrubs in the spring than in the fall.

No home is complete without a flower and vegetable garden, no matter how small.

Cosmos, salvia, marigolds, and other annuals may be lifted before frost comes and grown in the house.

Don't let weed seed ripen in the garden. Destroy plants before they seed. This will save much labor next year.

Bank up the celery plants with earth in order to get them to blanch. Earth is said to be better for late celery than boards.

Zinnias are coming more and more into use. The improved sorts are excellent in beds, and many of them make good bouquet material.

Fallen leaves should be raked off the lawn and piled in some out-of-the-way place and allowed to decay. They are useful in the garden when well decayed.

Flowers are fast becoming an important part of county fair exhibits. More entry classes should be created for the different varieties, and efforts should be made to stage exhibits to better advantage.

A few flowers of a kind, grouped loosely in a vase, make a much prettier bouquet than a large number crowded together. Do not put too many colors together; the effect is better with only one or two.

SEASONABLE HINTS ON FLORICULTURE

TO those interested in floriculture there is a lot of work to be done this month if best results are to be obtained. The hardy flower borders will require cleaning up by cutting down and removing all dead stems and foliage. Towards the latter end of the month give the borders a fairly heavy dressing of half rotted manure; this will protect the plants against injury from severe early frosts before sufficient snow has fallen to protect them and the rough surface formed by the manure has the added advantage of collecting a greater quantity of snow as it drifts along the ground, thereby giving greater protection to the plants. In spring this manure is dug into the border between the plants to enrich the soil.

SHRUBBERIES

Shrubberies should also have a dressing of manure to protect the roots against severe freezing; when dug into the soil in spring this will greatly assist growth. Too often we see shrubs with a miserably stunted appearance growing in sod; this is bad practice as the sod takes nourishment and moisture from the soil, prevents the free passage of air, and manure cannot be applied and dug in. This applies especially to shrubs in the early years of their growth. After they become well established, especially individual specimens, the grass may be allowed to grow closer around them for the sake of appearance. Shrubs that have been planted this fall should have their roots well protected by a heavy covering of strawy manure or leaves.

GLADIOLI BULBS

Gladioli bulbs that were planted this spring if still in the ground should be lifted and put in an airy cool place to thoroughly ripen, after which the stalks will come away readily from the corms, and the bulbs may be stored away in some cool place where the atmosphere is neither too moist nor too dry.

CANNAS

Cannas that have been lifted should be cut down to within a few inches of the roots and stored away in a moderately cool cellar, covering the roots with sand or sandy soil and giving just enough water throughout the resting season to prevent the roots drying out.

PANSIES

Pansies that were planted this spring will give abundance of flowers next season if well protected during winter; the best covering is an abundance of leaves or very strawy manure, which should be removed early in spring.

BULBS

It is not yet too late to plant bulbs; Single, Double and Polyanthus, Narcissus and Tulips are types excellent for this purpose. These may be planted in clumps in bare spots in the hardy flower border or shrubberies, or a formal flower bed may be planted solid with tulips if desired. Narcissus, crocus and snowdrops planted in odd corners of the lawn do well and are objects of beauty early in spring. In planting tulips and narcissus set the bulbs at least 6 inches deep and from 6 to 8 inches apart, cover with leaves or manure for the winter, removing this early in spring. Bulbs such as hyacinths, tulips and narcissus for winter and early spring flowering in the house should be potted without delay. Place several bulbs in each pot, using a good garden loam and a liberal quantity of sand and place the bulbs in the pot so that when they are covered with soil no part of them will be showing above the finished surface. Place the pots in a cold cellar, give the bulbs a thorough watering and if you have a quantity of cinders or sand cover the pots over, soaking the cinders also with water. No further attention need be given them for 6 weeks, by which time they will be in condition for forcing. Take off the covering of sand or cinders and stand the pots on top of this material. Select the most forward ones and force them in the house, leaving the others where they are in the cold cellar and every two weeks bring up a few more to force, in order to keep up a succession of flowers.

ROSES

While roses are more or less hardy it is not safe to risk them without protection. The hybrid perpetual classes are the hardiest, and in some parts of the province may go through the winter without protection other than the snow affords, but hybrid Teas and Ramblers are more tender and must have winter protection. The latter part of the month, or later according to weather conditions, is early enough to do this as by that time the plants will have thoroughly ripened their wood, become accustomed to fairly low temperatures, and be in good condition to stand extreme cold with protection later on.

There are many ways in which this protection may be given, the best being perhaps to mound earth up around the plants high enough to protect the lower buds on this year's wood; then smother the plants with leaves or strawy manure. The Rambling types which are used for covering fences, pillars, etc., should have the growths taken down before severe weather sets in and laid on the ground, covered with a few inches of soil, finishing up with leaves, strawy manure or corn stalks. It must be remembered that this class of rose is altogether different from the hybrid perpetuals and hybrid Teas in that it produces flower trusses almost the entire length of the growth, so it is important that the growth should be protected for its entire length. With the others, however, it is only necessary to protect the lower half of the plants, as the growths in their case are pruned down to three or four buds in the spring. Remove covering early in Spring.

A. H. WALKER,

Florist, Macdonald College

THE CARE OF RUBBER PLANTS

Editor, Journal of Agriculture.—

Will you kindly give me through the columns of your paper the best way of caring for Rubber Plants.

ENQUIRER

Reply.—

FICUS Elasticus, commonly known as the Rubber Plant, is one of the most popular house plants, and one of the most suitable for cultivation in the home. This plant possesses an ornamental foliage, and thrives either in warm or cool greenhouses or in living-rooms, etc., where its large, thick, ovate leaves with their dark green colour and glossy skin give a very pleasing effect.

As it is a native of India and other warm countries it is not surprising that this plant has a dislike for cold climates; the marvel is that it will thrive in such low temperatures as it is subjected to in slightly heated dwelling-houses; yet the fact remains that all it asks is good treatment by the grower.

During winter the Rubber Plant should be watered only when approaching dryness. This is easily discovered by rapping the pot with the knuckles and listening to the sound it gives. If the plant is sufficiently moist the sound will be dull; if dry or approaching dryness, the sound will be in a higher key.

The roots of the Rubber Plant should not be disturbed during the winter—between the months of October and April. When repotting is necessary it should be done from April to the end of July. The best soil for this plant is composed of two-thirds loams and one part leaf mould, with a liberal addition of sand. The pots should be well drained, and the soil pressed firmly down.

An occasional sponging with tepid water and a little milk will help to remove the dust from the leaves and add to their glossy appearance. Care should be taken not to expose the plants to cold draughts from open windows, nor to dry them out by exposure to fire heat.

Propagation

These plants are propagated chiefly from the stem, April to July being the best time for this operation. Remove two or three of the lower leaves about two feet from the top, make an incision under a joint, then place a small stake about two feet long against the stem and tie above and below the incision; this will tend to support it. Tie a handful of sphagnum moss over the incision and keep it moist until the roots show through. The portion should then be cut off, put in a small pot and placed in a close structure for a few days until the roots begin to take to the soil. Syringe only during this period.

Another method of rooting this plant is to cut off about two feet of the main stem, place in a vessel of water, leave it until it is calloused, then pot it and give it the same treatment as given to the rooted stem.

E. H. JONES

FIRE BLIGHT

LATE fall and early winter are the best seasons for our apple growers to attack the fire blight in their orchards, for the diseased branches and twigs are then planly visible and can be cut out and the disease eradicated with considerable thoroughness.

Most of our farmers are well acquainted with the disease although luckily the damage done in the province of Quebec is very slight compared with the scope of the disease in Ontario and the adjoining apple country in the States.

The reasons we have escaped so far are twofold; in the first place the climate is not so favourable as in Southern Ontario, and secondly apple growing has not developed to the same extent as in the sister province. In Quebec thousands of acres of apple orchards are still in sod, whilst in Ontario a good majority are cultivated thoroughly. Cultivation of the soil will increase the flow of sap in the trees and from a commercial standpoint the large increase in yield and quality is all-important. As far, however, as the disease of fire blight is concerned the organisms find more favourable surroundings in these juicy vigorous trees showing much young growth than in the slow growing dried up trees we find in sod orchards. Therefore the ravages in the cultivated orchard reach tremendous proportions in one season, whilst in the sod orchard ten times the amount of infection will pass unnoticed. However, this is not a plea in favor of the sod orchard. The sod orchard is a thing of the past, a memorial to the ignorance of our fathers. The cultivated orchard is the modern paying orchard and it is for our fruit growers to check the fire blight in the healthy vigorous apple trees.

To discuss how the disease should be counteracted in the spring or early summer is out of place here. By this time the bacteria have done their damage. The organism called *Bacillus amylovorus* has established itself in the bark of young twigs, water spouts, etc., has formed a slimy gummy exudate preventing the passage of water to the leaves, and these have consequently shrivelled up. The cooler weather and the absence of activity in the tree will prevent further spread of the disease, but the bacteria will winter over in the dry gummy exudate under the bark. The only remedy to prevent the spread of the disease in the following spring is to cut out the affected part and burn it right away. As soon as the leaves have fallen, the affected twigs, branches and blighted areas are plainly visible. When cutting out these areas we must remember that the bacteria have spread several inches beyond the blighted parts and we must cut from 6 inches to one foot away from the areas into the healthy bark.

Branches, twigs, water sprouts, which have died from the blight, show up clearly among the healthy naked limbs because the shrivelled leaves still stick to them. Further we must look for cancered areas at the base of water spouts at the main trunk and at the base of sucker growth. To remove these blight cancers we must cut a large piece out of the bark, cut deep in the wood, disinfect the surface and paint it. Orchards where these directions were carried out conscientiously did not show any fire blight the following spring. It is very important to burn all the diseased wood the same fall on the spot, otherwise large swarms of grubs of fruit bark-boring beetles will winter over in the diseased material and will infect all neighboring trees at the first sign of spring.

The fall clearing together with proper care during spring and early summer will check the disease effectively.

In the spring especially aphids will carry the disease through the apple orchard. In the fall the aphids are often found in large numbers on water spouts, as they gather there together from all over the tree. Cut off these water spouts and destroy them, it will make the spring work easier.

Besides apple, pear and quince trees there are some other trees subject to the disease, the hawthorn, June berry and mountain ash. Especially the hawthorn tree is a constant source of infection and we advice our apple growers strongly to cut down these trees in the neighborhood of their orchards. Pear trees are more subject to the fire blight than apple trees. Usually if a pear tree is once infected the disease continues to spread until the whole tree is dead. It is therefore useless to cut out infected areas in the fall. If it is possible to cut out affected parts as soon as they are formed in the spring the tree may be saved, otherwise the whole tree must be cut down.

J. VANDERLECK.

THE FARM AND FARM CROPS

SHERBROOKE COUNTY SCHOOL FAIR

THE third Annual School Fair for the County of Sherbrooke was held in the Lennoxville Academy Gymnasium on Saturday the 18th of September. The School Fair in the previous years was held in a tent in connection with the Sherbrooke Exhibition, but it was felt that if the School Fair could be held at some Academy it would call the attention of the pupils, the parents, and the teachers to the importance of the work being done in the Schools. This year there was much more interest shown in the work than heretofore. The various competitions were open to the School Pupils in the Townships of Ascot, Orford, and Compton.

The pupils started to bring in their exhibits quite early in the forenoon and all were in place at 11.30 a.m. The chickens were in crates arranged on the School Grounds, while the potatoes, tomatoes, swedes, oats, flowers, and weed collections were placed on tables decorated with red, white, and blue bunting in the gymnasium. There were 34 entries in the poultry classes, 61 in potatoes, 7 in tomatoes, 9 in swedes, 10 in oats, 69 in flowers, 9 weed collections and 4 weed seed collections. A large number of people attended the Fair, including pupils, parents, and teachers. Altogether the attendance reached about four hundred.

The judging commenced at 1 p.m. The judges were:— Prof. J. Murray (oats and swedes), Prof. W. Lochhead (weed collections), Mr. M. A. Jull (poultry), Prof. J. Murray and Mr. T. F. Ritchie (potatoes), Mr. T. F. Ritchie (flowers and tomatoes). The judges were all pleased with the quality of the exhibits. The chickens were hatched from eggs supplied by Macdonald College Extension Branch, and the grain, vegetables and flowers were raised from seed supplied from the same source.

At 2.30 the gathering adjourned to the Assembly Hall of the Academy, where several addresses were made and the prize winners announced. The local Demonstrator presided. Professor Lochhead, of Macdonald College, the chief speaker of the day, spoke on the importance of Agriculture being taught in the Schools and the value of the poultry, vegetable and flower competitions. Such work would create an interest among the boys and girls who should have some idea of farm operations.

Prof. J. Murray emphasized the necessary points in selecting a sample of grain for seed purposes. The sample which was best suited for seed purposes would be the best exhibition sample. Grain suitable for seed purposes should be free from weed seeds, true to variety, with all the small oats removed. The swedes were judged on the suitability of the type best adapted to producing root seed. A root, intended for producing seed, should have a good neat crown, smooth surface, well rounded to the tip, with freedom from prongs. Prof. Murray also spoke on the prevalence of Smut in this province and the methods of control.

Mr. M. A. Jull spoke on the objects of poultry competitions. He said that the results obtained depended largely on the amount of attention and the efforts given by the pupils who had obtained the eggs. There were 34 entries in the poultry classes, and the birds were judged from the utility point of view in preference to the exhibition type.

Mr. T. F. Ritchie was then called on to announce the winners in the sections that he had judged.

The fair was the most successful of the fairs that had been held in County of Sherbrooke. Sewing and cooking competitions will be added next year. In future, it is hoped that all pupils receiving eggs and seeds will exhibit the produce at the Fair.

W. G. MACDOUGALL,

Demonstrator

SCHOOL FAIRS IN THE DISTRICT OF BEDFORD

IN the District of Bedford the School Fair movement has been unquestionably successful. This year two fairs have been conducted under the direction of the Macdonald College Demonstrator at Cowansville. The interest on the part of both the children and the parents which was keen throughout the season developed into enthusiasm on the days of the fairs. The co-operation of the teachers has been a great help in making this work successful so far; the schools which have done the best are those where the teachers have been the most interested.

The classes in sewing and in cooking, particularly the latter, were keenly contested and attracted considerable attention. The class of Quebec No. 28 Corn was extremely good. There were several entries of remarkably good and uniform material, a fact which made this class very difficult to judge. The judge found that this was the best exhibit of corn that he had seen anywhere in Eastern Canada. Oats, potatoes, swedes, flowers(sweet peas, phlox, and asters), and weed collections were also shown. The eggs and the seed for the different crops were furnished by Macdonald College. The prize money was, for the most part, contributed by the different school boards and Homemakers' Clubs.

For a community to obtain the most for the children out of the School Fair movement it is essential that the school boards and the parents give the strongest co-operation possible. Without this co-operation the movement is doomed to be a failure; with it, the School Fair movement will be a big factor in agricultural development. Let every man and woman, then, do all that he or she can do to make this movement successful, for success means that the future agricultural standing of our district will be one of leadership in our country.—E. A. L.

SHAWVILLE EXHIBITION

PONTIAC Agricultural Society No. 1 held its annual Exhibition on Sept. 8th.—10th. under splendid weather conditions. However, owing to very bad weather previous to the fair, the attendance was not quite up to the average. The exhibits as a whole were also not quite normal, but on taking conditions into consideration the fair was certainly a very successful one.

The Hall Exhibits:—

A change was made in the shelving capacity to good advantage which gave fully one third more space. This year the central part was taken over by the Demonstration Branch of Macdonald College, in which were exhibited the chief varieties of grain and the results of treating grain for Smut. The exhibit of chief interest was a Model Silo, built on a scale of two inches to the foot. The grain taken from drained and undrained land also caused a great deal of comment, as it clearly showed the effect of too much water both on the crop and the under growth. It should be understood also that the material was all Pontiac grown with the exception of the cob corn and some of the vegetables.

The Pontiac Wool Growers' and Sheep Breeders' Association had an exhibit of wool, showing the different grades produced in the county and the grades of wool produced by the different breeds.

The Poultry industry was represented by a model house equipment, egg shipping boxes, and illustrations of various grades of eggs.

Ladies' Dept.

The lady exhibitors should be highly complimented on their exhibits of needlework, flowers, cooking, etc. which were far above the average, especially in the Potted Plants and Fancy Work classes.

Dairy Exhibits:—

The exhibitors of butter and cheese etc., were certainly at a great advantage this year in having a splendid refrigerator in which to place their exhibits, which was much appreciated.

Vegetables and Roots:—

The display of roots was a surprise in regard to both the number of exhibits and the size of the roots. Perhaps it would not be out of place to give a word of warning that greater care should be taken in future to select smoother and more typical roots for exhibit rather than the biggest and often very rough roots. Quality is required in roots and vegetables as well as in live stock.

The exhibit of Potatoes, while good, was very small.

Grain:—

On account of the very wet harvest the exhibits of grain were not up to the average, and in the majority of cases were much weathered.

In the oat class there were ten entries; in wheat the number of exhibits was not quite so great. The presence of Bunt or Stinking smut was quite prevalent, and a number of exhibits had not been cleaned properly to show them to the best advantage.

Horses:—

In the heavy horse classes the Clydesdales carried off all the honors, and it would appear from the horses exhibited that the district surrounding Shawville will shortly become known as a purely Clydesdale section.

In the light horse classes a number of teams came out in excellent condition, and were much appreciated by the spectators.

[illegible]:—

This part of the exhibition came out in stronger numbers than usual. Shorthorns, Holsteins and Ayrshires were the breeds represented. The following were the chief exhibitors:—Shorthorns: Mr. Thomas McDowell, Mr. Wm. Hodgins, Mr. Samuel Armstrong and Mr. J. H. Brownlee. Holsteins: Mr. J. M. Hodgins and Mr. E. T. Brownlee. Ayrshires: Mr. David McDowell, Mr. Roy Duff, Mr. J. C. Glenn and Mr. Wm. J. Horner.

Cow Testing Competition:—

This year another addition was made in the holding of a 36 hour test in the under-three-year-old class. There were six entries, a Holstein carrying off the honors with an Ayrshire a close second. In the mature class a Holstein again carried off the honors by a wide margin in a class of three.

The credit of holding this competition is due to Mr. R. W. Hodgins, Dairy Recorder for this County.

Sheep:—

Why are not the sheep men exhibiting more? Up to this year it was thought that poor accommodation was the cause, but this year this could not be said as one of the best sheep barns in Eastern Canada was put up and every thing was done to increase the exhibits. From the number of sheep on exhibition one would think that Shawville was not a sheep section.

Shropshire, Oxford, and Leicester were the breeds represented.

J. K. K.

NOTICE RE ELEVENTH ANNUAL REPORT

Of the Canadian Seed Growers' Association

July 23rd, 1915.

THE Eleventh Annual Report of the C. S. G. A., which is ready for distribution, contains addresses and papers of special interest to those concerned in matters pertaining to crop raising. In addition to reports and papers presented at Provincial Conventions, on the progress which is being made in the production of registered seed in the different provinces, a number of excellent pepers from leading agricultural authorities are included. Of these the following are worthy of special mention:—

"Patriotism and Production". By Dr. C. C. James, Ottawa.

"Systems of Crop Raising and the Production of Pure Seed on the Dominion Experimental Farms". By J. H. Grisdale, Director of Experimental Farms, Ottawa.

"The Interpretation of Plot Experiments". By Chas. Saunders, Ph. D., Dominion Cerealist, Ottawa.

"The Work of the Dominion Seed Branch". By Geo. H. Clark, Seed Commissioner, Ottawa.

"Seed Improvement in Prince Edward Island". By J. A. Clark, Charlottetown, P.E.I.

"Seed Improvement in the Province of Quebec for the year 1914". By G. A. Gigault, Deputy Minister of Agriculture, Quebec.

"The Co-operative Seed Association of Quebec". By L. Lavallée, St. Guillaume, P. Q.

"The Seed Centre as a source of Registered seed in commercial quantities". By Will C. Barrie, Galt, Ont.

"Buying and Selling Co-operatively". By F. C. Hart, Toronto.

"The Production of Registered seed in commercial quantities". By James H. Bridge, M.A.C., Winnipeg, Man.

"Work of the C.S.G.A. in Saskatchewon". By H. N. Thompson, Weeds and Seed Commissioner, Department of Agriculture, Regina, Sask.

"Seed Improvement and Agricultural Extension Work in Alberta". By E. A. Howes, Edmonton, Alta.

"The Canadian Seed Growers' Association in British Columbia". By J. C. Ready, Chief Soil and Crop Instructor for B. C., Victoria, B.C.

This report is being mailed only to members of the Association and to others who apply for it to *The Publications Branch, Dept. Agriculture, Ottawa.*

A NEW AND VALUABLE STOCK FEED

THE Government Elevators at Port Arthur, Moose Jaw, Saskatoon and Calgary are equipped with up-to-date cleaning machinery and facilities for grinding and bagging by-products of grain elevators. The grain dockage is recleaned to remove the weed seeds, chaff and dust and then ground to destroy the vitality of all seeds. The results of feeding experiments conducted at Ottawa Experimental Farm have shown this mixed grain meal to be a cheap and valuable feed for live stock. It is now available to Canadian feeders and feed dealers in car lots at moderate prices. Prospective purchasers should apply direct to the General Manager, Government Elevators, Fort William, Ont.

Seed Branch, Ottawa

THE IMPORTANCE OF GRAIN SCREENINGS

WEED SEEDS made up 16 per cent of the total weight of a car of western-grown flax. A sample representing over 25,000 bushels of wheat contained only 92.6 per cent by weight of pure wheat, the remainder being largely made up of weed seeds. Such are the statements embodied in a pamphlet issued by the Seed Branch of the Department of Agriculture at Ottawa that can be had gratuitously by addressing the Publication Branch of the same department.

The pamphlet is entitled "Grain Screenings" and R. Dymond, B.A., Seed Analyst, is the author, he having been assisted in the work by E. S. Archibald, B.A., B.S.A., Dominion Animal Husbandman, and F. C. Elford, Dominion Poultry Husbandman, who contribute "Results of Feeding Experiments" at the Central Experimental Farm. These are given with elaboration of detail that add much to the pamphelt, which the dedicatory announcement truly says "is of importance to all concerned in the production, handling and uses of grain and its products."

The heads of the different sections into which the pamphlet is divided are: Composition of Screenings, Uses of Screenings, Grinding Screenings, Screenings in Feeding Stuffs, Flax seed screenings, and Feeding Experiments. The last mentioned were made most thoroughly with cattle, sheep, swine and poultry and the conclusions reached are elaborately tabulated. The importance of proper screening to the grain grower, thresherman, miller and feed manufacturer is minutely detailed and a summary given, in which it is set forth:—

That the material removed from grain at terminal elevators consists of shrunken and broken kernels of wheat, oats, barley and flax, besides varying proportions of a very large number of weed seeds.

That up to the present, most of the screenings from our terminal elevators have been exported to the United States, where they have been recleaned and used in various forms in feeding live stock.

That on account of the extremely small size of some, and the hard, flinty seed-coats of others, the complete pulverization of all the weed seeds in screenings cannot be accomplished by an ordinary chopper.

That screenings recleaned over a one-fourteenth inch perforated zinc screen to remove the finer weed seeds (black seeds) may be satisfactorily ground by ordinary choppers, if reasonable care is taken in the separation and grinding.

That feeding stuffs manufactured from screenings, not properly recleaned, sometimes contain thousands of vital noxious weed seeds per pound. Such material should never be fed as it is liable to introduce weeds that entail the loss of thousands of dollars.

That feeding experiment have proven that the black seeds are useless as feed and expensive as adulterants. Their admixture in any considerable quantity to other feed makes it unpalatable for all kinds of stock.

That screenings without the black seeds, may be fed freely to horses, cattle, sheep or swine, but it is more profitable to have such screenings compose not more than 50 to 60 per cent of the total grain ration. Buckwheat screenings are especially valuable as poultry feed.

That more attention to the cleaning of grain as it is threshed will save the cost of transporting the screenings to the terminal elevators, and will leave the grower in possession of much valuable feed which, if he does not need for his own use, will find ready sale among live stock men.

That the growth of weeds entails an enormous loss each year to farmers, and while it is desirable to utilize everything in grain screenings of good feeding value, it would be better to burn them than to permit their use in ways that will bring about any increase in the number or distribution of noxious weeds.

LIVE STOCK

SOME OBSERVATIONS AS TO QUANTITY AND QUALITY OF MILK

WHERE there is an opportunity to take observation and records of a large number of cows the conclusions arrived at may be fairly well accepted. One of the first conclusions drawn from recent observations under these conditions is that the more milk a cow gives the poorer the quality; and the less milk yielded, the better the yield of butter fat. Many farmers have for a long time held this opinion from their own observations. It does not follow of course that a cow giving a large quantity of milk may not give it of better quality than another that gives a smaller quantity. Each case depends upon the personal character of the cows. So far as feeding is concerned, while this may increase the quantity and perhaps the quality of the milk for a time, there is no feeding that will turn a bad cow into a good one for the dairy. When the flush of grass comes in May, the yield of milk from all cows goes up, and the quality goes down. In August the reverse of this taken peace. An increase of milk may be obtained at the latter time by high feeding, but this increase is not a profitable one, for the increase does not pay for its cost.

The public has an idea that a farmer can water his milk through his cows' mouths, but this has been proved to be a fallacy. Cows have been made thirsty by giving them salt, and they have then drunk large quantities of water, and it has been found that the water had no effect whatever upon the milk.

When the milk fat from a cow gets dangerously near 3 per cent, or falls below this, the reason is that the cow is a natural giver of poor milk, and unless she gives such a large quantity as to make up for the deficiency, she should be fatted off, or otherwise turned out of the herd. With Ayrshire cows, it has been found that older cows give more milk and for a longer time than younger cows, but the milk on the other hand has been found to have slightly less butter fat in it.

There was a time when the farmer was advised to get rid of the dairy cow after the third calf, on account of the danger of milk fever or parturient apoplexy, but now that scientists have discovered how to combat this disease by injection of a preparation of iodine, the farmer may profitably keep his cows until they are eight or ten years old, or more.

Apropos of the subject of milk fever it has been suggested by some dairy farmers of the writer's acquaintance that they secure a high degree of protection from this disease by more frequent milkings of the cow after calving, and by not taking away more milk at a time than would be taken naturally by a calf. And it has been shown by valuable experiments that the application of preventive methods is of most importance before the third, and especially the fourth and fifth calvings; heifers and old cows are less liable to the disease.

B. C. T.

A LEADER IN RICHMOND COUNTY

A man of commendable public spirit, a leader in all the agricultural enterprises of his community is Mr. R. G. Dunbar of Melbourne Ridge. That his neighbors appreciate Mr. Dunbar's ability as well as his willingness to be of service is evidenced by his holding the presidencies of no less than four organizations—the Melbourne Ridge Telephone Association, the Melbourne Farmers' Club, the Melbourne Cow-testing Association and the Richmond Wool Growers' and Sheepbreeders' Association.

Mr. Dunbar's farm is situated upon Melbourne Ridge, one of those heights from which are visible the broad valleys and gently sloping hills characteristic of the county. The farm comprises 170 acres and is conducted with special reference to winter dairying and to sheep breeding. The dairy herd is partly purebred Holstein and partly grade. From twelve to fifteen cows are milked, the milk being sent to a creamery. Mr. Dunbar, who is a firm believer in cow-testing, estimates that in 1912-13 his cows averaged $75 net cash in production. Mr. Dunbar also believes thoroughly in the value of sheep upon a farm. His permanent pastures are free from any weeds other than an occasional butter-cup, while the adjoining fields of his neighbors are infested with all the varieties of weeds common to the district. Mr. Dunbar reports that the ravages of dogs have done great harm in Richmond County. His own flock has suffered in this way, a few sheep having been lost two or three years ago. Mr. Dunbar's flock is of the Shropshire breed and numbers thirty odd.

FLOCK OF SHROPSHIRE SHEEP—Owned by Mr. R. G. Dunbar, Melbourne Ridge.

Mr. R. G. Dunbar, Melbourne Ridge, Que. One of the prominent farmers of Richmond County.

AN EXPERIMENT IN FEEDING COMMERCIAL GRAIN SCREENINGS

The object of the experiment was to ascertain the extent to which commercial grain screenings may be used and their value as feed for feeding and fattening lambs.

The work was undertaken as a fourth year thesis in Macdonald College by L. J. Westbrook and R.E. McKechnie under the supervision of the Animal Husbandry Department. The screenings were supplied by the Dominion Seed Branch. Sixty four lambs, eight lots of eight each, were carefully selected for weight, condition, and general uniformity. These were ear marked and individual weights were taken fortnightly throughout the experiment. The screenings were all finely ground, grain was used for some of the lots, and alfalfa and turnips were fed as coarse feed throughout the feeding period, each daily ration being weighed separately.

At the beginning an allowance of one half pound of screenings per lamb per day was given and the amount was gradually increased to one and a half pounds per day. It was found that if the amount of screenings was increased too rapidly at any one time the lambs were very easily put off their feed. This occurred in some cases when the increase per week amounted to three-eights of a pound.

Name	FEED CONSUMED FOR 100 LBS. GAIN.			Value of Screenings when grain ration of bran and oats is worth.	
	Concentrates	Roots	Alfalfa	$25	$30
Complete Screenings 1 pt. Grain 1 pt..	453	1150	401	27.38	33.30
Oats 3 pt. Bran 1 pt. . . .	484	1220	428	25.	30.
Buckwheat Screenings . . .	537	1356	475	21.34	25.60
Screenings with Black seeds removed	548	1382	484	20.75	24.90
Complete Screenings	565	1425	500	19.80	23.94
Screenings with Black seeds removed 3 pts. Grain 1 pt.	627	1052	526	18.55	22.27
Buckwheat Screenings 3 pts. Grain 1 pt.	723	1213	606	15.25	18.31
Black seeds 3 pts. Grain 1 pt.	745	1250	625	14.64	17.57

It will be seen in the above table that a check lot received a ration of grain including three parts oats and one part bran, three lots received screenings only and four lots received a combination of screenings and grain.

The results show that the lot fed the grain was surpassed by one lot and unequalled by the others. The combination of complete screenings and grain in equal parts produced 100 lbs. gain with the least feed. The same lot also produced the greatest total and daily gain. Where screenings were fed without grain the gains were good and ranked as follows:—

Buckwheat screenings first,

Screenings with black seeds removed second,

Complete screenings third.

The last three lots received two pounds of roots each per day while all other lots received three pounds of roots each per day. This was not intended as a feature of the experiment but the last three lots were started later in the winter when roots were not so plentiful and the allowance was reduced.

In these lots receiving only two pounds of roots per day and with grain added to the various screenings products the results were not so good as when they were fed previously without the grain, but received more roots. In the case of the leading lot in return for feed, the one on complete screenings and grain added, three pounds of roots were fed because this lot was in the first part of the experiment. The fact that a larger proportion of grain was used and the lambs fed somewhat earlier may have made a difference but all through this work the succulency of the roots seemed to have much to do with the relish for screenings shown by the lambs. This was particularly true of buckwheat screenings and the pulverized black seeds which, in the opinion of those in charge, were eaten with considerable relish largely because of the roots fed in conjunction with them.

TABLE SHOWING DETAILS OF EXPERIMENT.

Lot	No. of lambs	Avg. weight at beginning	Length of feeding period	Feed consumed	Total gain	Avg. gain per lamb per week
Check lot Oats 3 pts. Bran 1 pt.	8	76.6	70 days	472 lbs. Oats 160 " bran 1616 " roots 560 " alfalfa	130¾ lb.	1.63
Complete screenings	8	75.7	70 days	632 lbs. complete sc. 1616 " roots 560 " alfalfa	112 lbs.	1.40
Complete screenings 1 grain 1 pt.	8	72.5	70 days	472 lbs. complete sc. 120 " oats 40 " bran 1616 " roots 560 " alfalfa	139½ lb.	1.74
Screenings with black seeds removed	8	74.5	70 days	632 lbs. black seeds removed 1616 " roots 560 " hay	115½ lb.	1.44
Buckwheat screenings	7	73.7	70 days	553 lbs. buckwheat sc. 1414 " roots 490 " alfalfa	103 lbs.	1.47
Screenings with black seeds removed 3 pts. grain 1 pt.	8	76.5	84 days	600 lbs. black seeds removed 144 " oats 43 " bran 1344 " roots 672 " alfalfa	127¾ lb.	1.33
Buckwheat scr. 3 pts. grain 1 pt.	8	81.6	84 days	600 lbs. buckwheat sc. 144 " oats 48 " bran 1344 " roots 672 " alfalfa	110¾ lb.	1.15
Black seeds 3 pt. grain 1 pt.	8	81.4	84 days	600 lbs. black seeds 144 " oats 48 " bran 1344 " roots 672 " alfalfa	107½ lb.	1.11

Because of the supposed risk in feeding the black seeds exclusively a special lot of two lambs was fed on this feed as an exclusive grain ration. Roots and chaffed hay were mixed with the seeds and fed liberally with the idea of inducing the lambs to eat large quantities of the pulverized black seeds. Very striking results were obtained with this practice. The lambs were induced to eat as high as two pounds of the seeds per day. They remained in perfect health, marketed in good condition and showed remarkable gains. They were fed side by side with the other lots and almost equalled the two best lambs in gains. In the ten weeks they gained an average of two pounds each per week while the two best lambs averaged 2.25 lbs. per week. It should be remembered, however, that in all other lots the lambs were fed what was considered a fairly full but limited ration while in this case they were fed to their utmost capacity.

The results as a whole certainly suggest further important work in feeding screenings to lambs. While they are not conclusive it seems reasonable to believe that all ground screenings including black seeds may be safely fed in fairly liberal quantities to lambs and that they have considerable commercial value for such feeding.

H. BARTON and A. A. MACMILLAN

SOME FLOCKS, HERDS AND FARMS OF THE BEDFORD DISTRICT

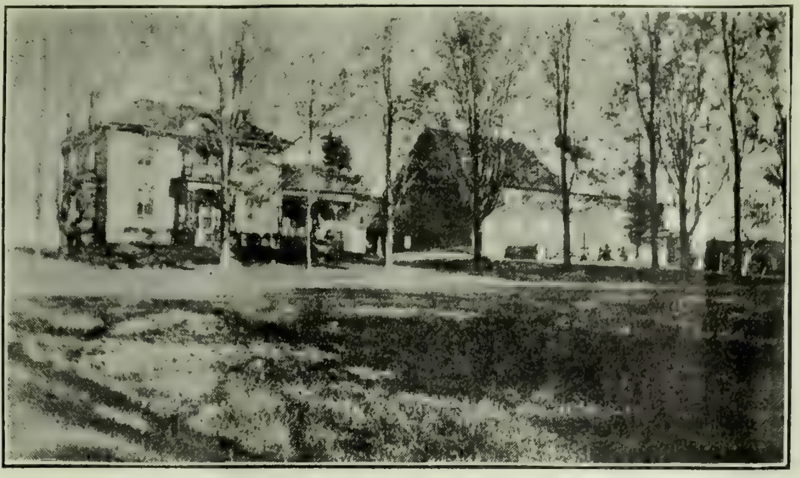
III—The Home of Jersey Cream Cheese

MESSRS. N. P. Emerson and Son are conducting an extraordinary, if not unique, enterprise on their Highland Farm at Sutton Junction. This consists in making cheese from Jersey Milk. They milk about 25 cows, all pure-bred, though unregistered, Jerseys. From the rich milk of this herd they make cheese daily and the skill attained by this constant practice has not only enabled them to carry off three first prizes at the provincial and one at the Sherbrooke Fair every year for five years, but has also secured and held a high class market for "Emerson's Jersey Cream Cheese." Some of the grocers catering to the best trade of Montreal have a standing contract for this cheese at a wholesale rate of 20 cents per pound for new and 25 cents per pound for old goods.

Highland Farm has an area of 300 acres. The home is a well built house surrounded by a neat lawn. The farm buildings are thoroughly modern, the stables are all cement and are supplied with running spring water. Mr. Emerson, Senior, was one of the earliest of our Quebec farmers to build a silo. After thirty-two years of service this silo is still in use.

The farm of the Messrs. Emerson was selected by the Lands Committee of the Conservation Commission for the location of one of its alfalfa plots. The land being very acid in this section it was very hard to get a good crop but the plot was in pro-

Highland Farm Herd. N. P. Emerson and Son, Sutton Junction.



Residence and Barn, Highland Farm. N. P. Emerson & Son, Sutton Jct.

mising condition at the end of July when two crops had been taken off.

IV A Veteran Sheep Breeder

MR. H. E. Williams of Knowlton is one of those farmers, unfortunately rare in the Eastern Townships, who have long recognized the suitability of that hilly county to the requirements of sheep raising. Mr. Williams has been breeding sheep for fifteen years and, thoroughly understanding the management of a flock, has found them the most profitable animals on his farm. Like his neighbors he has a dairy herd. It consists of Jerseys and Ayrshires. The milk and cream are shipped to Montreal. Thus far Mr. Williams conforms to the farming practices of his neighbors. The difference lies in his having another important string to his bow. He keeps a flock of about 140 purebred Shropshire sheep on his 280 acre farm. He is a prominent member of the Wool Growers' and Sheep Breeders' Association of the District and believes thoroughly in the principle of co-operative sales. He is strongly of the opinion that sheepmen should strive to have the present legislation on the dog question improved. He regards the present law as quite unfair to the sheep breeder. It is no easy thing to get up a petition of one-fourth of the rate-payers of a township demanding that a dog-tax be imposed, and even if this is accomplished the breeder who is so unfortunate as to live near the border of another township is still unprotected. Mr. Williams hopes that legislation may soon be adopted which will give adequate encouragement to the reviving sheep industry of the province.

Mr. H. E. Williams, Knowlton, Que. A prominent sheepbreeder.

V—The Clover Ridge Ayrshires

MR. Wilton Dryden of Cowansville is one of the enthausiastic Ayrshire men of the district. His Clover Ridge herd includes 10 registered head and a number of grades. His herd is headed by a four year old of his own breeding, Clover Ridge Abram. The dam of this bull this year produced 3865 lbs. of milk in three months.

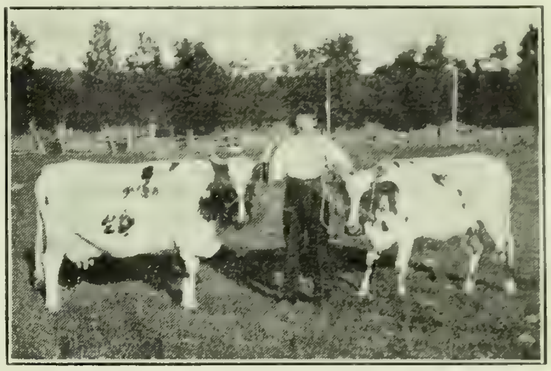
A Five-Months, Calf of Stonehouse Fancy Yet and a Six-Years' Son of the Proprietor, Mr. Wilton Dryden, Cowansville.

Another of the highly prized members of his herd is a granddaughter of Primrose of Tanglewyld, a cow with a record of 16,196 lbs. milk and 626 lbs. fat. Notable among the females of Mr. Dryden's herd are Stonehouse Glenburn, 26969, and her daughter Clover Ridge Glennet 40986, Stonehouse Fancy Yet 43134 (4265 lbs. milk January 6th.—June 30th.) and her heifer calf and Stonehouse Maple Leaf, 42554 (6540 lbs. milk Sept. 12—June 30). Stonehouse Glenburn is a granddaughter of St. Simon of Auchenbrain, 4900, whose daughter Auchenbrain Brown Kate 4th. has a yearly record of 23022 lbs. milk, 917.6 lbs. fat and 1079 lbs. butter. The dam of Stonehouse Fancy Yet qualified in the States as a two-year old with 8749 lbs. milk and 419 lbs. butter. Barebeskie Sybil (imp.) dam of Stonehouse Maple Leaf, qualified in 296 days as a two-year old 6080 lbs. milk, 270.9 lbs. fat.

Mr. Dryden milks 10 to 12 cows, ships cream to Montreal and feeds Chester White pigs. His fowls are White Wyandottes. That he is educating his children to take an interest in the stock is evident from our illustrations.

The Clover Ridge farm is not large. Of its 75 acres, twenty-five have been in permanent pasture and woods, but Mr. Dryden has managed to change so that the ridge land can be covered every four or five years and the lower portions about six or seven years at a time. Practically all the ploughed land is in one field, an arrangement that renders cultivation convenient and saves much time. Mr. Dryden is an enthusiastic corn grower. He feeds ensilage from early fall until grass and has some left over for summer feeding. Indeed, last year's supply lasted to the middle of August. One of the variety corn tests of the Macdonald College Extension Branch is under Mr. Dryden's charge. On account of lack of storage space only a small quantity of roots are grown. Alsike and red clover hay are produced. Alfalfa has been tried but, as yet, without success. Mr. Dryden intends trying it again as soon as he gets his couch grass under control.

A Group of Ayrshires on Clover Ridge Farm. Property of W. Dryden, Cowansville.



MOTHER AND DAUGHTER.—Note similarity of marking.

Left: Stonehouse Glenburn, 26969. Right: Clover Ridge Glennet, 40986. Stonehouse Glenburn has produced 3875 lbs. milk in three months. Property of W. Dryden, Cowansville.

The Clover Ridge farm has its share of boulders but by dint of hard, persistent labor, supplemented by dynamite, Mr. Dryden has collected them practically all into a single pile and now has less than a dozen stones showing above ground in the cultivated land. He contemplates underdraining and has taken a one-third share in a cement tile ma-

TWO-YEARS-OLD AYRSHIRE HEIFERS.

W. Dryden, Cowansville.

Left: Stonehouse Maple Leaf, 42554, 6540 lbs. milk, Sept. 12, 1914 to June 30, 1915.

Right: Stonehouse Fancy yet, 43134, 4265 lbs. milk, Jan. 6 to June 30, 1915.

chine. Mr. Dryden owns another piece of machinery that he finds very useful, namely a six-horse-power gasoline engine. It serves to run the ensilage cutter, a grinding mill and a wood-saw.

With youth, enterprise, intelligence and a capacity for hard work on his side the proprietor of Clover Ridge farm bids fair to make its name and his well-known in the Ayrshire world.

AGRICULTURE IN RURAL SCHOOLS

By Prof. S. B. McCready

WHEN country people rediscover their own schools and get their eyes opened to the rich possibilities that lie in education of the right kind for them as farmers, we are going to see a great advance in rural Ontario and the cause of agriculture.

We may have to wait until the next generation makes its influence felt, but the country leaders who are developing in our schools through the proper teaching of agriculture will undoubtedly exert a great influence when they "arrive." The place of the new kind of country teacher who will come into being will then be exalted and a new kind of school (or different new kinds of schools) to more adequately meet the country's needs will be formed. As man's continual struggle with nature in his agricultural work is to be the moral equivalent of war, so through the teaching of agriculture are country people to find new schools and new possibilities in education.

THE DAIRY

ST. HYACINTHE DAIRY SCHOOL

Winter Course 1915-16

Course 1. November 15th to 30th. For expert testers of milk and cream only.
" 2 In English. December 6th to 24th. Expert Testers and Butter or Cheese makers.
" 3. January 10th to 29th. For makers and experts.
" 4. February 1st to 20th. For makers and experts.
" 5. February 28th to March 18th. For makers and experts.
" 6. March 20th to April 11th. For makers and experts.

For admittance to these courses write to

O. E. DALAIRE,
Director,
St. Hyacinthe, P.Q.

The Annual Convention of the Society of Dairy Industry will be held at Farnham, county of Missisquoi, December 1st and 2nd 1915.

MILK

The Problem

IN the last issue of the *Journal* a most significant observation of Mr. J. A. Ruddick was quoted at length. Mr. Ruddick, the Dominion Dairy Commissioner, had been discussing what he is credited with considering *the* problem in buttermaking—"the fact that butter of inferior quality can be sold at the same price as other butter produced under very much better conditions.' He shows clearly that the "tendency to strike an average value neither encourages the progressive buttermaker who turns out a superior article, nor punishes the indifferent or careless maker whose product is of inferior quality."

It would be but ill-concealed pedantry on my part were I to attempt to draw the attention of the readers of the *Journal* from a consideration of the deliberate statement of the Commissioner for Dairying. Those who know anything at all about the present conditions as they affect the buttermaking industry are so well aware of the facts as stated that a sigh of relief is expressed when the official dairy representative of the Dominion Government places the case fairly and squarely before the producers, the manufacturers and the public.

My purpose is to transfer the contention of the Dairy Commissioner to a consideration of the question of milk. What is true of butter is more true of milk. Butter is an important factor in the economics of the home; much more so is milk. The butter supply of a city, say Montreal, is a highly important consideration. The milk supply of a city, say Montreal, is even more important. If butter of such quality as is considered desirable cannot be manufactured in the near vicinity of the city — whether it is, or is not, will not here be discussed—it can be manufactured elsewhere, in another part of the world if necessary. It can then be conveyed under modern conditions of transportation and, provided of course that it has been in the first place properly manufactured, be delivered in Montreal fit for the palate of the most epicurean of diners.

This is quite impossible when dealing with milk. Milk must not only be produced, but it must be transported and consumed while still comparatively fresh. Hence the area of production must be within easy access of the centre of consumption.

The collecting and distributing agent concerned with the milk trade enjoys the privilege but shoulders the responsibility of supplying the public with this, the most natural and nutritious of all articles of diet. And what is his position? With certain well-defined exceptions he has to sell his milk at a uniform price. The majority of his customers demand milk at as reasonable a rate as it is possible for them to obtain it; and they cannot well be blamed. They do not, however, enquire as to the origin of the milk, the location of its production, the number of hours which have elapsed since the withdrawal of the precious fluid from the udder of the cow, the number of bacteria which the milk contains per cubic centimetre or per quart, nor the treatment which the milk has received at the hands of the vendor. These queries are put by the few, by the very few. The great consuming public ask for milk as such; and as such they get it.

I know that in the city of Montreal there are many consumers who are anxious to secure the best and cleanest milk obtainable; and these same consumers would readily take advantage of any information which would introduce them to the best source of supply. Are they, however, prepared to incur the extra cost which is necessarily entailed in the supplying of milk which is higher in quality than the average: average being a detestable term which should be erased from the vocabulary of the producer, purveyor and consumer of milk?

There are some milk vendors, not many, in Montreal who are straning every nerve in the effort to supply clean, wholesome and healthy milk. What encouragement is there when they have to compete with those, and these are many, who buy and sell milk solely and entirely as a means of making money without regard to quality either chemically or bacteriologically? That is one phase of the problem.

The milk dealer or vendor purchases his milk from the farmer. Other than in exceptional cases he offers such price for the milk as is incumbent upon him because of market conditions, and the prices offered by his competitors. The farmer, when he has the necessary commercial knowledge, sells his product in the best market. If he is a particularly progressive man he endeavors to produce his milk under the best possible conditions; he produces it from herds free from disease, and from herds housed under hygienic conditions. What is the position? Other than in the exceptional cases mentioned above he is compelled to compete with the man whose cattle, stable and methods of production are undesirable in the extreme and in some instances a disgrace to the community.

There is a problem which has baffled antiquity; and unless a rapid change be made will baffle posterity.

Solutions have been devised, are being attempted, and possibly in time the same will be effective. In a subsequent issue of this *Journal* it is these upon which I would propose to comment.

WILFRID SADLER,
Bacteriology Department,
Macdonald College

THE AYRSHIRE IN HER NATIVE HOME

FOR one who is an ardent admirer of fine dairy cattle, a trip to the home of the Ayrshire in Scotland is well worth while. Such a visit should be made in the cool summer, (for Scotland knows no sweltering sunshine) when the beautiful red and white cows, with their picturesque upturning horns, have free range on the large, gently rolling, luscious pastures.

The more intensive dairy region in Scotland lies south of Glasgow, in the county of Ayr, or Ayrshire, from whence the cattle derive their name. The writer had the pleasure of cycling through this interesting section and will relate some of his experiences on this journey.

From Larne, Ireland, it is only a short boat trip across the Irish Sea to Stranraer, a small port in the southwest corner of Scotland. From the latter port my companion and I rode north along the coast road, through some of the old, clean, quaint villages overlooking the sea. Fitful showers did not hinder us in our riding as the road was well macadamized. Many pleasure seekers were enjoying their vacations in the numerous seashore resorts and from all appearance the rains seemed to give them no worry, for they went on with their golf playing and country walking, as if showers were a common occurrence and of no lasting endurance.

In the vicinity of Girvan, many acres of potatoes were being harvested by Irish laborers composed of men, women, and children. All the tubers were dug by hand and it was an interesting sight to see an army of thirty or forty people working their way diligently across the field. The laborers work in pairs, one digs two rows while the other picks up the potatoes and puts them in baskets. One particular group of forty-one laborers was working so fast that we went over to the "boss" and asked him if he was paying by the basket or day. He told us that he was paying his help three shillings, or seventy-two cents, a day for ten hours' work, the laborers furnishing their own board.

From Girvan our road took us into the city of Ayr, the native home of "Bobbie" Burns. The old, quaintly thatched cottage in which the poet was

THE DAIRY SCHOOL FOR SCOTLAND

born is located on the outskirts of town, and is kept in good repair.

At Kilmarnock, located about twenty miles south of Glasgow, in the heart of the Ayrshire region, there is an exceptionally fine dairy school. Professor Drummond, who is of Canadian birth, is at the head of this institution. It was indeed a great pleasure to be taken through this practical dairy school and watch the girls and boys making butter and various kinds of cheese. Everything was kept scrupulously clean, but the following bit of sarcastic humor was found printed on cardboard and tacked up in the work room:

1. On entering, pay no attention to your feet as regards dirt; the mats at the door are simply ornaments.
2. Pupils who assist to stir the curd in the vat should not trouble to wash their hands, as it is a waste of both time and soap.
3. Allow as much whey as possible to drop from your hands and arms onto the floor or sides of vat, as there is always some one in attendance for the purpose of wiping this up.
4. Pupils should not trouble to brush the curd from their hands and arms after stirring in the cooler, but instead should wipe the curd and the oil on the towels and cloth, as it is no trouble to wash them.
5. While the butter is being made up, pupils should lounge on the table, as this looks well; besides it is not necessary for more than one or two to see what is being done at a time.
6. Pupils who use the wash basin should not be particular as to the amount of water left on the floor and wash stand, and the same water should be used as long as in a liquid state.
7. The towels, after using, should be left in a twisted or rope form on the rollers; in this way too rapid drying is prevented.
8. After the utensils have been cleaned, pupils should finger the brasses, etc., as much as possible —this gives them a finished appearance.
9. Enter the office and other private doors without rapping, as this indicates good manners.

By Order

The writer is happy to say that all these rules were disobeyed.

South of Kilmarnock we visited a large number of very prominent cattle breeders and exporters. All the farmsteads were kept in neat and attractive condition. The general arrangement of the farm buildings is unique and handy. Permanent material, such as brick or stone, is used exclusively in the construction of the buildings. The house usually faces the road and forms one side of an open court while the cow stable, the dairy building, and the hay and implement shed are built so as to form the other three sides to the open, central court. Cement floors are being used more and more in the dairy buildings and in the cow stables; however, stone and brick floors are to be found on some farms.

Practically all the land is worked by tenants with long time leases. Indeed, it is not uncommon to find generation after generation of the same tenant families on the same farm. We find none of that shifting, ever-moving tenant population, which is so common in American agriculture, and this helps to give a substantial, solid atmosphere to Scotch farming.

Cows in Scotland are cared for very differently than in this country. The usual practice is to have the stock come fresh early in the spring. The Scotch, as well as the English, are master hands in the growing of hay and pasture, and on this account the cows are allowed the run of good heavy pasture during six months including late spring, summer, and early autumn. The heavier producers receive a little oil cake in addition to the pasture. In winter the cows receive a fine quality hay, together with oil cake and a few roots. As the cows are only milked for nine months each year and do not receive much grain, no phenomenal records are made, but the life and usefulness of the cow is lengthened.

A few minutes ride beyond the picturesque village of Fenwick we visited the "Hillhouse" farm, which is operated by Mr. James Howie, a well known cattle breeder. On the opposite side of a meadow we found Mr. Howie busily mending some fence. After chatting awhile about his splendid, heavy hay crop we strolled down to the pasture where the cows were peacefully cropping the tender grasses. Mr. Howie is a breeder of high producing cows and is emphatically opposed to the old time show-type Ayrshire, and it was a pleasure to learn that the old show-type, with the small, flat udder, was rapidly losing popularity in its native land. As a breeder of fine bulls, Mr. Howie has no peer. This fact is exemplified by the large number of prizes he has won at the shows. His two-year-old bull, Sir Hugh, was grand champion and champion Ayrshire at the Highland Show in 1913. While at the Royal Agricultural Show in England we saw one of Mr. Howie's yearling bulls get first prize and later the same animal took first at the Highland Show.

While it is true that conditions in Scotland and America are widely different, yet the fundamental principles of proper dairying are the same in both countries. It is in these fundamentals, such as efficient cows, proper care and feeding of the stock, cleanliness in the dairy, economy in producing the finished product and economy in handling fertilizing materials, that the average Scotch dairyman is more efficient than our American dairyman. Americans are noted for their ingenuity and inventiveness, but they are not prone to profit by the hard gained experience of people in older countries. The Scotch dairyman should not be envied by us, but we should profit by his good example.—*E. M. Clark* in "Hoard's Dairyman", 1914.

POULTRY

POULTRY REQUIRED

We are in a position to sell for our members live poultry—chickens, pullets, turkeys, ducks, geese, pigeons, etc. The sales that we have made up to the present time of farmyard stock show that it is to your interest to send them to us. We are able to obtain good prices for you at the present time, and to create a good market for the future. Live poultry sells well until the very cold weather sets in.

If you have no live poultry to sell, keep them and send them to us in the cold weather. We are certain to be able to obtain the highest market prices for your dressed poultry at the right time.

Re Butter and Cheese. We pay regularly each month for the produce which is sent to us.

The Co-operative Cheesemakers' Agricultural

Society of Quebec·

63 William Street,

MONTREAL

HEALTH OF FOWLS

Two Bulletins of premier importance have recently been issued from the Health of Animals branch of the Federal Department of Agriculture at Ottawa, of which Dr. Torrance is the Veterinary Director General. Both can be had free on application to the Publications Branch of the Department.

The first, number 17, is entitled "Entero-Hepatitis or Black-head in Turkeys". Chas. H. Higgins, B.S. D.V.S., of the Biological Laboratory is the author. While the disease has been known to affect all species of fowl, it is usually seen in its most aggravated and fatal form in turkeys. Dr. Theobald Smith, of the United States Department of Agriculture, made an investigation in Rhode Island during 1894 and 1895, but it was not until 1900 that the first mention was made of it in the Experimental Farms Report of Canada. It has since, however, been repeatedly reported upon in the biological laboratories both at Ottawa and Guelph. Dr. Higgins says that the losses from the disease have been enormous, which supplies excellent reason for a close study of the Bulletin. "The extent of these losses", he further says, "is well indicated by the fact that two decades ago a single small island (Block Island) off the Rhode Island coast, provided two tons of marketable birds each year. Five hundred pounds are not available in the same locality today. Statements are also current that in localities in Ontario where ten carloads were to be had eight years ago it is now difficult to secure two carloads. The reason given for the falling off in production is the difficulty of rearing stock that can withstand this infection." This quotation is sufficient to indicate the importance of this Bulletin, which treats of the origin and course of the disease and of its prevention and cure. Appropriate plain and coloured illustrations add to the value of the publication.

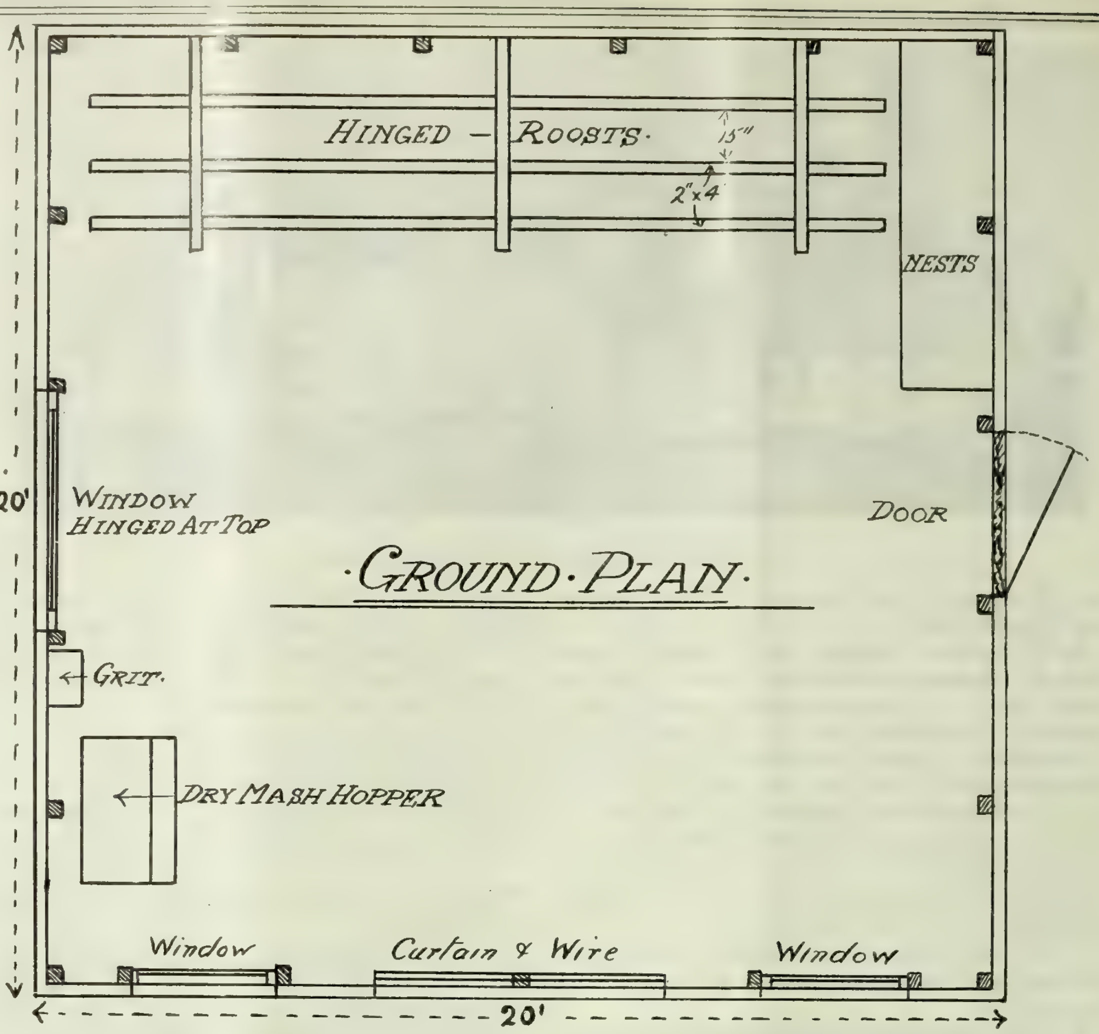
The second Bulletin numbered 18 has for its title, "Avian Tuberculosis". Dr. Higgins, Pathologist, and A. B. Wickware, V.S., Assistant Pathologist, are the joint authors. It is hardly necessary to allude to the importance of checking and suppressing a disease that affects alike birds, beasts and man. The authors show that the complaint can be transmitted by domestic pets to those who caress them and in the reverse direction. Details of experiments made at the Dominion Biological Laboratory are given in the Bulletin, which also describes the symptoms, steps in prevention that can be taken and remedial treatment that can be applied.

In both Bulletins poultry breeders and all persons interested are invited to send cases to the Biological Laboratory, Department of Agriculture, Ottawa, for investigations.

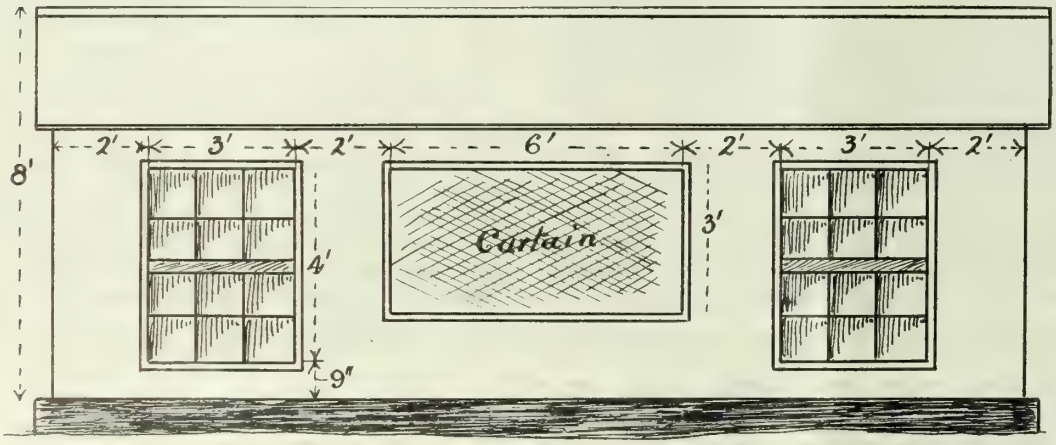
HOUSING THE LAYING STOCK

ONE of the things upon which profitable egg production depends is a good and comfortable house. The more eggs laid during the winter months, the larger are the profits from the farm flock, but in Quebec the difficult problem is to get the hens to lay during the cold months of the year. On some farms the hens are allowed to roost in a draughty shed, and on other farms the hens are kept in the horse or cow stable. On many farms, however, poultry houses are provided for the hens, but they are often too small, poorly ventilated and with damp floors. Poor housing conditions are often responsible for a low winter production from a good flock.

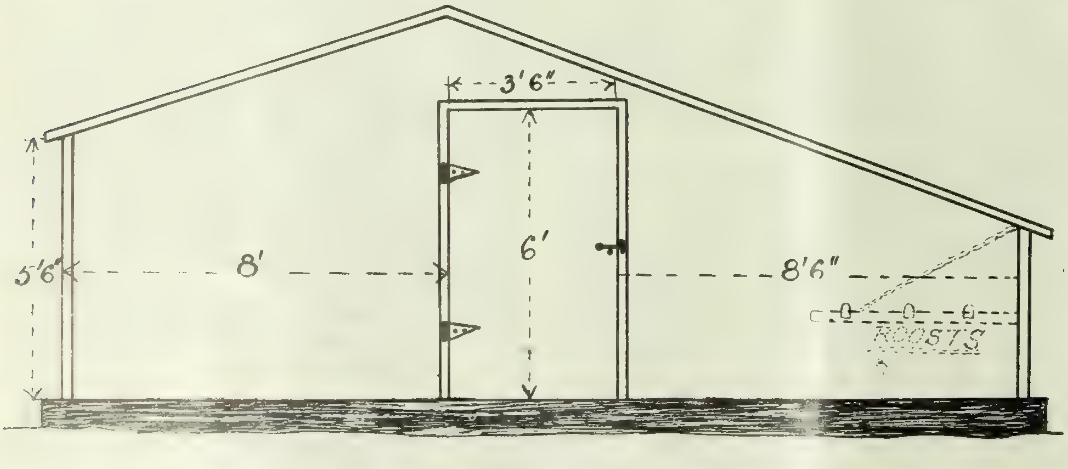
THE MACDONALD HOUSE.



Ground plan of a laying house for 100 hens. The "Macdonald House".



·FRONT·VIEW·S·



·EAST·VIEW·

The "Macdonald House"

It cannot be said that any particular type of poultry house is the best; local conditions determine to a large extent the exact type which will give good results. At the same time, there are general principles which apply everywhere.

The poultry house should be comfortable the year round; it should supply the fowls with fresh air at all times, but should be free from draughts; it should be fairly light. A house is usually comfortable which provides plenty of fresh air and yet is free from draughts. It may be necessary to provide curtains in the front of the house, and perhaps occasionally in front of the roosts on very cold nights. One should not be too dependent upon the use of curtains, however, and they should be made more or less stationary features. Use a cheap grade of cotton for curtains, as it is much better than the more expensive grades.

Houses with open fronts or cotton fronts have proved quite satisfactory, even in the most severe weather. It has been found that egg production is good an dthat the fowls keep in a thrifty and vigorous condition. Chicks hatched from stock kept in fresh air houses are usually much stronger and thriftier than chicks hatched from stock kept in warmer houses. A house which is open on the south side must be well built on the other three sides in order to make it draught proof.

The location of the house should be dry. If the ground is not dry naturally, it should be well drained. This may be done by putting in a tile drain or an ordinary ditch drain. The yards should be drained so that they will be dry most of the time. A damp ground is cold and it soon gets sour and unhealthy for poultry. Chickens do best on a sandy or gravelly loam. Both of these types of soil are usually easily drained and may be kept in a nice sweet condition.

Houses that face the south will get the largest amount of exposure to the sun's rays and this is what the fowls enjoy. A slightly eastern exposure is to be preferred to a western exposure, except in the case of prevailing east winds. We have all of our houses facing due south and we find this very satisfactory.

A safe working rule is to allow about four to six square feet floor space per bird. The lighter breeds, Leghorns and Anconas, are more active than the general purpose breeds, Plymouth Rocks and Wyandottes, and they will stand slightly more crowding. It is a good plan, however, to give the birds as much room as possible, keeping in mind the cost of construction per bird.

Small flocks usually pay better than large ones. A flock of twenty-five birds will usually lay more eggs per bird than a flock of one hundred. It will cost more to construct four houses for four flocks of twenty-five birds each, than one house for one hundred birds, and it will take more labor to care for the four flocks. The larger egg production secured from the smaller flocks would doubtless more than offset the extra cost of labor. Then again, a flock of one hundred birds can be divided into four flocks in one large house. Under the best management the smaller flocks should be more profitable, though many farmers have good success with a flock of one hundred layers.

Damp air in the poultry house is fatal to egg production. It is much better to have a cold dry house than a warm damp one. Hoar-frost on the walls of a house is the result of warm, moist air coming in contact with the cold walls. If the foul air is gradually diffused with fresh air, no frosts will occur.

An earth floor is frequently satisfactory, where the soil is light in texture and is well drained; otherwise a board or cement floor is better, and preferably the cement floor, as it is more durable and sanitary.

The nearer square a house is — other things being equal — the less lumber it will require. A long narrow house is colder than a short deep one, because it has a larger area of exposed surface.

The shape of the roof influences the cost of construction. The steeper the pitch the greater the comparative cost of building a shed — as compared with a gable or combination-roof house. The steeper the roof the greater the cost for roofing, but the longer it will last. Most roofs can be one fourth pitch, while shingle roofs should be one third pitch.

A poultry house should be simple of construction, and the fewer permanent fixtures there are the better. The feeding hoppers, dusting boxes and nests should be movable, in order to make the house easy to clean.

The roosts should be placed low down, particularly for the heavier breeds. Leghorns require about eight inches of perch room, Plymouth Rocks about nine inches, and Brahmas about ten inches. The roosts may be made of 2" x 4" scantling or of 2" x 2" pieces, with the corners slightly rounded.

When a dropping board is used it should be placed low down to admit of easy cleaning. For one roost, the dropping board should be twenty inches wide, and for two roosts the boards should be three feet wide. It should be made of matched lumber and should be well constructed, especially where nests are located under the dropping board. We do not use dropping boards at all and we find that we save much labor.

Nests are made about 12" x 15" and they should be dark, as this tends to prevent egg eating.

All poultry houses should be kept in a clean and sanitary condition always. Cleaning and disinfecting should be regular and thorough. Use a ten per cent solution of a good commercial disinfectant, and spray the house or apply the disinfectant with a brush. The roosts and roosting quarters should be painted with disinfectant every two weeks during warm weather, and less often in cold weather.

THE 100 HEN HOUSE

We have been using two houses which are especially adapted for farmers' use, and up to the present they have given good satisfaction. They are both open front houses, curtains being used in cold weather. There is practically no difference, except that we have found the "Tolman" house a little more comfortable on extremely cold days. It is a low house and is a little more sheltered than the "Macdonald" house. On the other hand, the "Macdonald" house is lighter and is more comfortable in warm weather.

In using curtains with these houses we try to make it as simple a matter as possible. The houses are left open as much as possible, and we use more curtain as the weather gets more severe. In the front of the "Tolman" house there are five sections, and it is very rarely that all the sections are covered with cotton. In the late fall, when the first cold snap comes, we usually put cotton over each section at the ends of the house, leaving the three centre sections open. When colder weather sets in, we put cotton over two more sections, leaving the centre one open entirely, unless it drops to 20° below zero.

We have made an improvement in the "Macdonald" house by placing a frame of shutters over the opening in front. The shutters are each two inches wide and they overlap one another about one inch. This makes the house a little darker but it serves to break any possible draught into the house and it keeps out all rain and snow. The cotton curtain is used beneath the shutters in very cold weather only.

These houses have given good results and can be recommended for general use. They are convenient and inexpensive, but they have one objection which should be mentioned. We have had difficulty in keeping both houses thoroughly dry during the coldest weather.

M. A. JULL

POULTRY AT THE RURAL SCHOOL FAIRS

The number of rural school fairs held in the English speaking sections of the Province of Quebec has increased from three in 1913 and nine in 1914 to fourteen in 1915. At each of these fairs chickens have been exhibited by school children of the rural schools and academies in the various districts. The chickens exhibited were hatched from eggs supplied by Macdonald College, and the work of distribution and general oversight in the raising of the chickens was conducted by the Macdonald College Demonstrators. The rural school fairs constitute one line of extension work which is being prosecuted by Macdonald College, and the object in distributing eggs to school children is primarily an educational feature. The idea is to give the rural school pupils an object lesson in a practical phase of agricultural production. The children are given a direct interest in poultry raising and are taught how to raise chickens and why certain methods should be adopted in order to gain the desired results. Another object in conducting this educational work is to secure greater interest in poultry husbandry throughout the country, which should result in the more extensive development of the poultry industry.

The eggs are supplied free of cost to the most deserving pupils, who are selected by the College Demonstrators with the co-operation of the principals of the academies and the teachers of the rural schools. The conditions upon which the eggs are supplied are simple: each applicant agrees to do the best possible with the chickens hatched and to show them at a rural school fair provided for the purpose. At the fourteen rural school fairs held in 1915 a number of prizes were provided, and each fair proved to be an educational feature not only for the school children but also for the people of the community. The competitive spirit is developed to a certain extent among the school children, but what is more important is the direct object lesson provided. The exhibitors are able to determine the best manner in which chickens should be reared and exhibited, and this should prove a great stimulus to future development along poultry raising lines.

The prize list provided at each fair was so planned that each competitor was placed upon an equal footing. Prizes were offered for the best chickens raised from the setting of eggs distributed, for the best pen of five birds, for the best trio, and for the best cockerel and pullet in the show. This provided for liberal competition by all exhibitors and at the same time it gave the students a chance to learn the best types of poultry. In this manner the ability of each student as a successful poultry raiser was put to a test and the object lesson was provided in the selection of superior birds.

At the time of the distribution of the eggs a four-page pamphlet was given to the school children receiving the eggs. This pamphlet furnished directions for the handling and care of the eggs, the choice and care of the hen, the construction of the nest, methods of marking, feeding and raising the chickens.

The poultry exhibits at the rural school fairs in 1915 were a decided improvement upon the exhibits of the two previous years. The number of entries at each fair and the number of birds shown by the exhibitor is given in the following table:—

RURAL SCHOOL FAIRS IN QUEBEC, 1915

	Place	*No. of Entries*	*No. of Birds*
1.	Shawville	41	207
2.	Lachute	27	145
3.	Huntingdon	27	162
4.	Howick	26	88
5.	Hemmingford	11	47
6.	Cowansville	19	134
7.	Bedford	19	86
8.	Richmond	21	89
9.	Danville	17	59
10.	Lennoxville	34	161
11.	Ayer's Cliff	29	142
12.	Cookshire	18	108
13.	Scotstown	15	63
14.	Chapeau — Returns not available at time of writing.		

Considerable improvement can be made in the exhibiting of the chickens. In the majority of cases they are exhibited in home-made crops, which are often poorly constructed and do not allow of the birds being shown to good advantage. The birds at the Cowansville Fair were shown in the best manner, wire coops being used in which they could be seen by the judge to the very best advantage, and could also be handled. Good exhibition coops were also provided at Ayer's Cliff, Lachute, Bedford, Shawville, Lennoxville and Scotstown. The cooping and exhibiting can be greatly improved at Huntingdon, Howick, Hemmingford, Richmond and Danville.

In the majority of cases the chickens were well developed and they were quite uniform in size. Nearly all the birds possessed good constitutional vigor and were of good type, although at each fair great differences were observed in the development of the various hatches. In some cases one lot of chickens was not half the size of another lot, although they were hatched at the same time. This is clearly a case of difference in management and rearing, and those pupils who were not successful in securing prizes should determine to do better next time.

While one of the fundamental objects of this extension work on the part of the College is to interest the school children in practical problems of agriculture, it also works for the improvement of the poultry industry of the province; it secures practical results and greater interest in poultry raising; it tends to improvement in breeding in the various districts and the establishment of community breeding centres. The continuation of this phase of extension work should do much to improve agricultural education and agricultural production in the Province of Quebec.

M. A. JULL

WOMAN'S WORLD

FOODS AND FOOD PREPARATION—Lesson XX

Flour Mixtures (Continued)

SCHEDULE FOR DOUGHS

Name	Flour	Liquid	Sugar	Salt	Shortening	Eggs	Lightening agent	Flavoring	ingredients Other
Hot Biscuit	2 c.	2-3 c. milk (about)		½ teasp.	1 tblsp. butter & 1 tblsp. lard		4 teasp. baking powder		
Butter Biscuit	2 c.	⅓ c. milk (about)	2 tblsp.	¼ teasp.	4 tblsp. butter	1	4 teasp. baking powder		
Rock Biscuit	2 c.	½ to 2-3 c. milk	2 tblsp.	¼ to ½ teasp.	4 tblsp. butter	3	4 teasp. baking powder		2 tblsp. chopped peel, 4 tblsp. currants.
Shortcake	2 c.	⅓ c. milk (about)	2 tblsp.	¼ teasp.	4 tblsp. butter	1	4 teasp. baking powder		1 box fresh washed strawberries
Doughnuts	2 c.	½ c. milk	½ c.	¼ teasp.	2 tblsp. butter	1	2 teasp. baking powder	¼ teasp. cinnamon	
Fruit Cookies	3 c.	1 tblsp. if required	1¼ c. brown	¼ teasp.	1 c. butter	3	1 teasp. soda & 2 teasp. cream of tartar	½ nutmeg grated	1 c. currants
Rich Cookies	3¼ c.		1½ c.	½ teasp.	1 c. butter	3	1 teasp. soda	1 teasp. cinnamon	1 c. chopped walnuts ½ c. raisins ½ c. currants
Oatmeal Macaroons	4 c. rolled oats & 3½ c. white flour	2 c. butter milk	2 c.	1 teasp.	1 c. butter	2	1½ teasp. soda	2 teasp. cinnamon & 1 small nutmeg	1 c. raisins
Oatmeal Cookies	2 c.	1 c. sour milk	1 c.	½ teasp.	1 c. butter	1	2-3 teasp. soda		2 c. rolled oats.
Vanilla Wafers	2 c.	¼ c. milk	1 c.	½ teasp.	1-6 c. butter 1-6 c. lard	1	2 teasp. baking powder	2 teasp. vanilla	

NAME	REMARKS.
Hot Biscuit...	Bake in hot oven about fifteen minutes.
Butter Biscuit	If desired, brush over surface before baking with diluted egg yolk, — 1 tblsp. water to 1 yolk.
Rock Biscuit...	Drop from teaspoon to buttered sheets. If desired, brush surface with egg white before baking.
Short Cake	Bake mixture in a round layer cake tin. When done split in halves with two forks. At moment of serving place between layer two-thirds of berries which have been sweetened and crushed. Whipped cream on top and whole berries.
Doughnuts...	Fry in deep fat at 360°F. for about five minutes, turning after first two and a half minutes.
Fruit Cookies	Roll out. Cut in shapes and bake in hot oven. Do not roll as thin as most cookies.
Oatmeal Macaroons...	Drop from teaspoon to buttered sheet.
Oatmeal Cookies...	Roll upper cookie out thin and fill with date filling.
Vanilla Wafers...	Using a small portion of dough at a time, roll out to "wafer" thinness and bake on buttered sheet. Remove them as they turn deep golden. Avoid scorching them.

Method of making soft doughs

1. Have all ingredients cold.
2. Mix and sift together the dry ingredients (including sugar).
3. Cut in the shortening with knives, or rub with the tips of the fingers until mixture is granular.
4. Add the milk *gradually*, using a knife for mixing. If egg is used add beaten egg to milk.
5. When dough is of the proper consistency turn out on a dredged board; pat and roll out to ¾ of an inch. Cut out with dredged cutter. Bake on unbuttered pan.

Method of making stiff doughs

Use the same method as for drop batters. When all flour is added turn out dough on a dredged board and, if necessary, knead in more flour. Roll out to desired thickness and cut in shape with dredged cutter.

For Fruit Cookies.—Rub together the shortening and dry ingredients. When mixture is granular add eggs and milk as a liquid. Mix well and knead in more flour if necessary.

The secret of success in making hot biscuit is:

(1) Have a hot oven.
(2) Have materials cold.
(3) Add the milk *gradually*. Do not pour in the milk and get a pasty mass.
(4) Have the dough as soft as can be patted or rolled out, and do not work any flour into the mixture after turning out on the board.
(5) If a large number of biscuits is being made, pat out part of the dough at a time.
(6) Work quickly after adding milk and handle as little as possible.
(7) Brush milk lightly over the top, and bake in a shallow pan, to obtain a golden brown color.

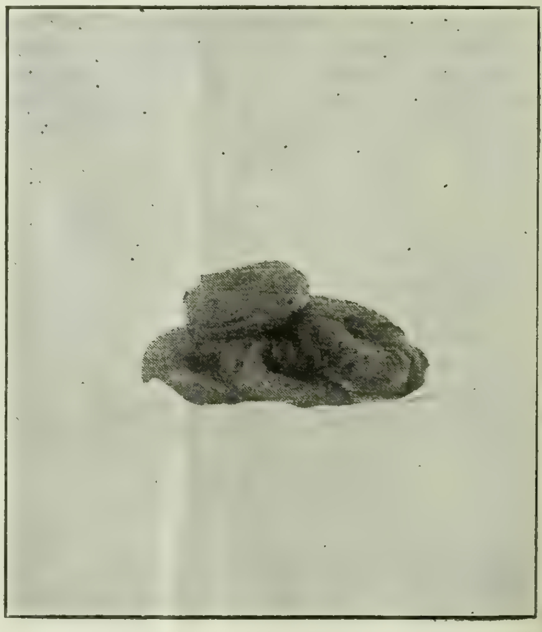
Hot biscuit—Light, tender and golden brown.

In frying doughnuts the secret is to have the fat the right temperature. Use a thermometer if possible, but if one is not available test fat with a piece of bread. When fat is the right temperature the bread should brown in one minute. Do not put in too many doughnuts at a time in case the temperature is lowered. Fat soaked doughnuts are an abomination.

Try these doughnuts. They are excellent.

4 c. flour
1¾ teasp. soda
¼ teasp. grated nutmeg
½ tblsp. butter
1 c. sour milk
1½ teasp. salt.
1¾ teasp. cream of tartar
¼ teasp. cinnamon
1 c. sugar
1 egg.

Put flour in shallow pan; add salt, soda, cream of tartar and spices. Work in butter with tips of fingers; add sugar, egg well beaten, and sour milk. Stir thoroughly, and toss on board thickly dredged with flour; knead slightly, using more flour if ne-



Doughnuts—Crisp and not fat-soaked.

cessary. Pat and roll out to one-fourth inch thickness; shape, fry and drain. Sour milk doughnuts may be turned as soon as they come to top of fat, and frequently afterwards.

F. CAMPBELL

CARPET BEETLE

THE Buffalo moth or carpet beetle is very abundant this year in some localities, and heroic efforts are needed to destroy it, if it once finds lodgment in a home. In such case, rugs should be removed for a thorough cleaning, and should be left in the sunshine as long as possible. If the moths have attacked a carpet it should be thoroughly sprayed with gasoline. If they have gotten into cracks in the floor or beneath the baseboards, all dust should be removed from cracks and the floors should be thoroughly scrubbed with soap and water. As a further aid cracks may be sprayed with gasoline or kerosene and filled with plaster of Paris. The grubs may be trapped by putting old woolen cloths on the floors of closets. They will gather on these and may easily be destroyed. Various fumigants may be used, but these are more or less dangerous and should not be used without consulting an expert for particular instructions.

The insect as usually seen is about a quarter of an inch long and bears transverse rows of long brown hairs. From the rear end projects a bunch of longer hairs.

RIDDING A HOUSE OF FLEAS

Editor, Journal of Agriculture.—

WILL you be kind enough to tell me how I can get rid of fleas in my home? I have tried formalin, closing the house for the entire day, but without result. M.L.T.

ANSWER:—There are two or three species of fleas that trouble inmates of houses—the human flea and the cat and dog flea. The latter are more common, and are usually the cause of most of the trouble. The eggs of fleas are white and are laid among the hairs of the cat or dog, but the eggs soon drop to the floor where they hatch into long worm-like grubs. These grubs live on the material found in the dirt along the cracks of the floor, and about the base boards. It is hard to believe sometimes that cats or dogs are responsible for the breeding of the fleas, for the owners are so careful not to allow any of these animals to come into the house; in some cases, however, the introduction of the fleas can be traced to the habit of allowing cats and dogs free access to the house. Fleas cannot breed out of doors and the only method therefore of controlling them would be to take strong measures and regulations regarding cats and dogs entering the house.

We know of no way of killing fleas wholesale unless the owner can move out of his house for a couple of days and have it fumigated thoroughly with hydrocyanic gas, in which case all the fleas in the house will be killed. Other eradicators are used to prevent the breeding of fleas, but they are much slower in their action. In any case the following precautions should be taken:—

1. Keep the cats and dogs clean. They should be washed thoroughly with carbolic soap and then dusted with insect powder. This operation should be repeated in two or three days.
2. Sleeping mats or other articles upon which the animals lie should be beaten and dusted well with insect powder.
3. The floors of infested rooms should be scrubbed with hot suds and sprayed with benzine. The rugs should also be sprayed.
4. It is said that a thorough spraying of a room with oil of pennyroyal will drive the fleas out. We have not tried this remedy so cannot vouch for it.

A lady living in China, where fleas are very abundant, kept her house immune from fleas by dissolving alum in the whitewash or kalsomine that covered the interior walls, putting sheets of thick paper that had been dipped in a solution of alum under the matting, and scattering pulverized alum in all crevices where insects might breed. This lady states that powdered alum may be sprinkled upon carpets already laid then brushed or swept into the mesh without injury to the carpet, and with the certainty of banishment of many insect pests, including both fleas and moths.

These precautions require considerable trouble, but to prevent the breeding of fleas they must be followed.—W. L.

OF GENERAL INTEREST

THE HESSIAN FLY IN THE WEST

THE Hessian-fly is well-known to farmers as a serious pest of cereal crops; during the present season it has caused the loss of millions of bushels in the United States. In Western Canada its depredations fortunately have not attained the extent experienced in other regions of the continent and in order to be able to advise the farmers in the western provinces the Entomological Branch of the Dominion Department of Agriculture have investigated this insect. The results of this investigation, which was conducted by Mr. Norman Criddle for several years, have now been published by the Department in Entomological Bulletin No. 11, in order to enable farmers to recognise the injury of the insect in its incipient stages and, being thus forewarned, they will be in a position to prevent losses that are liable to occur where the insect is present, as control methods are also described. In addition, the Western Wheat Stem Maggot has been studied and described. This is a native insect that has turned its attention from native to cultivated grasses on which it can become a serious pest. Its habits, life-history and the means of control are fully described in the same bulletin, which is entitled "The Hessian Fly and the Western Wheat Stem Sawfly in Manitoba, Saskatchewan and Alberta". The bulletin is illustrated and may be obtained free on application to the Chief Officer, Publications Branch, Department of Agriculture, Ottawa. All inquiries for information regarding insect pests should be addressed to the Dominion Entomologist, Department of Agriculture, Ottawa.

FORAGE PLANT TESTS

RESULTS of experiments in crop production and field work can never be without interest or without value and, therefore, a publication describing them must be exceptionnally welcome. Such a work is Bulletin No. 84 of the Division of Forage Plants, Dominion Experimental Farms, that gives a summary of results reached at the Central and different branch farms and stations throughout the country, and that can be had free on application to the Publications Branch, Department of Agriculture, Ottawa. There are included also some recommendations as to the varieties to grow, or crop production methods to follow, as deduced from the results of experimental work in the various provinces. A variety of tests at the Central Experimental Farm in Indian corn showed that the best varieties in ears of twelve experimented with were Quebec Yellow, Windus Yellow Dent, Canada Yellow and Free Press, and that, while of the ensilage varieties proper, Argentine Yellow gave the highest yield in tonnage, White Cap Yellow Dent, Golden Glow, King Philip and Wisconsin No. 7 reached a more advanced stage of maturity. Eighteen varieties of turnips were tested, thirteen of mangels, five of carrots, and four of sugar beets. Of the turnips nine varieties produced over 2½ tons dry matter to the acre. Of the mangels half a dozen varieties yielded 3¼ tons of dry matter to the acre. Of the carrots White Belgium gave 24 tons, 400 pounds of crop with 2 tons, 1,905 pounds dry matter to the acre and Ontario Champion 25 tons of crop and 2 tons, 1,650 pounds dry matter.

With a view of securing data, bearing on the possibility of producing field root seed profitably in Canada, a great number of seed roots were selected, not only at the Central Farm, but also on most of the branch Farms and Stations in the eastern provinces. At the Central Farm about 12,000 mangels of the Long Red variety and 3,000 Magnum Bonum swede turnips were secured for the purpose from the general farm crop. In addition, about 3 tons of mangels of the Long Red and Yellow Intermediate types were selected from the plots grown for variety tests by the Division of Forage Plants.

In leguminous forage plants many tests were made for hardiness, quality and quantity. In order to arrive at a proper understanding of the nature of a number of Canadian grasses and sedges, arrangements were made to secure, through exchange, a representative collection of grasses and sedges from Northern Europe. About a thousand sheets of duplicates were prepared for this purpose and sent forward. The reports from the superintendents of branch farms and stations will be found of the greatest interest, each especially to farmers in the respective province represented.

LOSSES OF POTASH FROM THE MANURE HEAP

FARMYARD manure contains its potash in two forms: the soluble compounds coming from the urine, and the insoluble compounds present in the litter. The sum of the two amounts to about 15 lb. of potash per ton of manure, or rather more than the quantity found in 1 cwt. of kainit or ¼ cwt. of sulphate of potash. The soluble part is liable to considerable loss by washing and drainage unless the heap is adequately protected from heavy rainfall.

At Rothamsted the following losses were found to occur:—

		Heap sheltered from rain, drainage at a minimum.	Heap exposed to rain, considerable drainage.
Potash originally present in heap.	lb.	147	175
Potash left after three months' storage	lb.	130	123
Potash lost	lb.	17	52
Per cent. of total		12	30

The liquid drainage away from the heap contains the potash; if it is carefully kept the loss is less serious. Hendrick has recently shown that on an average it contains 0.46 per cent. of potash, or 300 gal. contain about as much as is present in 1 cwt. of kainit, and in an admirable state of availability. Good results were obtained by applyit to grass land.

It appears, then, that the waste of potash on the farm need not be great. The chief points of leakage are the cattle yard and the manure heap, and the chief way in which loss arises is through wastage of the urine and of the brown liquid draining away from the manure. If these sources of loss are stopped, the circulation of potash between the soil, the crop, and the manure heap can be kept up without much loss.—*Dr. E. J. Russell in Journal of the Board of Agriculture.*

SILAGE ACID

THE term "silage acid" has been used so frequently among those interested in silos, and has been claimed by various people to be so destructive to materials used in silo construction that the average farmer has a very exaggerated opinion of its effects.

A thorough knowledge of "silage acid" can be readily gained by studying the process of silage fermentation. This is simply and clearly explained in Bulletin No. 70, from Storrs Agricultural Experiment Station. Quoting that bulletin we find:

"The amount of acid present in fresh corn juice is about two-tenths of one percent or less, being but a little more than the acidity of fresh milk.

"When the juice of green corn stalks is pressed out there is obtained a greenish-brown, thick syrupy liquid with a very sweet taste and a rather peculiar honey-like aroma. According to the chemical tests this sugar is mostly dextrose, the most easily fermented sugar. The sugar in this corn juice averages three to four percent. This sugar in the process of fermentation entirely disappears and no satisfactory attempt has been made to explain its mode of disappearance. Sugar solutions, when allowed to ferment spontaneously, always have a tendency to be changed into acids or alcohol or both. The percent of acids produced in silage is almost exactly equivalent to the percent of sugar that was present in fresh silage. In the intermediate stages of fermentation alcohol is produced which is probably changed subsequently into acetic acid.

"A silo is a type of 'quick process' vinegar factory. In the cutting of silage every piece is covered with a film of sweet juice. This film of juice affords an ideal medium for the growth of sugar fermenting yeasts and bacteria, which begin to grow as soon as the silage enters into the silo. The work of the bacteria in changing the sugar to acids and of the yeasts in changing the sugar to alcohol is performed for a time, till the lactic acid bacteria cease to work and the yeasts complete the fermentation of the remaining sugar. The alcohol produced is immediately acted on by acetic bacteria and changed to acetic acid.

"In the souring of milk many of the several varieties of bacteria commence to increase along with lactic acid bacteria, but the miscellaneous varieties are soon checked by the acid produced by the lactic acid bacteria as they are more sensitive to acid than are the lactic acid bacteria. By the time milk curdles from the acid produced, most of the miscellaneous bacteria are killed or pickled. The acid bacteria grow for a short period but soon are stopped by the production of their own acid. Soured milk is pickled milk as silage is pickled corn, pickled by the acids produced from the sugars by the acid bacteria. The acid prevents the growth of putrefactive bacteria. Sour milk and silage will keep as long as acid destroying organisms are kept from them. The acid destroying organisms are certain molds and Oidium lactis. When these destroy the acid present, then sour milk and silage will spoil or decay. It is an important fact that these acid destroying organisms require the presence of air. To keep silage, then, is to keep air from it. A dairyman kept silage for seven years and found that it had rather improved in quality than deteriorated.

"The acidity of silage is the most important factor connected with the fermentation. It is the acid which preserves the silage and prevents destructive fermentation which would change it to humus. The acidity combined with the lack of air contact are the two elements of preservation. If acid destroying organisms are kept from silage it will keep indefinitely.

"The percent of acid in silage is never much less than one percent and never much over two percent. The average would be nearly one and one-half percent. This means that in one hundred tons of silage three thousand pounds of mixed acids are present. If these acids could be separated from the silage they would be worth $1,700 more than the silage at the average market price.

"The amount of acid consumed by the cow is quite startling. Suppose a cow is fed 40 pounds of silage in a day. In this silage there is about 10 ounces of pure acid which would be equivalent to the cow's drinking seven quarts of vinegar a day. The equivalent for a man would be three pints of vinegar a day. These amounts of vinegar would certainly be demaging in either case. But since acetic acid is much less in amount than the more favorable lactic acid its presence does not seem to be harmful. The lactic acid is very beneficial as an appetizer and as a tonic to digestion. Silage contains carbon dioxide of differing amounts during fermentation and subsequently. An attempt to boil away the carbon dioxide will also evaporate the volatile acids present. The carbon dioxide forces out most of the air in the air spaces during the active fermentation process. This may have an important bearing in the preservation of silage. Whether or not the carbon dioxide continues to fill the hollow spaces has not been determined."

A summary of this process is therefore the heating of the silage until the juice is transformed to lactic acid, then, if all air is excluded, to alcohol, and finally to acetic acid, the principal element of vinegar—and the quantity of this acid present in silage seldom exceeds two percent.

Further, is it reasonable to believe that stock would eat (with a decided relish) anything that contained injurious acids? If they did, surely the effect would not be that known to be produced by silage feeding with its ususually good results when used for dairy cattle and other kinds of livestock.—*Ohio Farmer.*

DRAINAGE QUESTIONS AND ANSWERS

WHY Drain Wet Land?—Because it draws out the cold, stale water and lets in the warm, fresh air. Because it makes the roots go deeper. Because it makes the corn rows straighter. Because it pays.

In What Ways Can Land Be Drained?—By preventing the entrance of damaging water on one side or by helping it to escape from the other.

What Do Drains Do? — They lead damaging water around a field or hasten its passage through it. They carry water from the surface of the ground and from between the soil grains.

Why Use Tile?—Because, if properly laid, they remain for a lifetime at the depth to which they were laid and you do not have to dodge them or built a bridge to cross them.

How Much Does Tiling Cost?—Aside from the outlet, 10 to 40 rods of 4-inch tile may be required per acre. This costs about 75 cents a rod for tile and labor.

How Much Is Tiling Worth? — A Wisconsin farmer wrote March 20, 1915: "A crooked muskrat slough spoiled 20 acres of land for me. Last fall I spent $192.50 for tile and labor and tiled it. This spring it will be the first land I plow. Those tiles are worth a thousand dollars to me."

What Is the Best Kind of Tile to Use?—Vitrified tile are probably the best, but they cost twice as much as the unglazed tile and are not twice as good, except at an exposed outlet. Unglazed tile may be made of clay or shale. The shale tile are the harder. Cement tile properly made are all right, but farmers are apt to be careless in making.

How Deep Should Tile Be Laid?—Three feet in clay; four feet in muck or peat; at least one foot below the top of a sandy subsoil; but just in the top of a layer of hardpan, even though it be only two feet below the surface. Thus covered, they may freeze with safety, if they are empty when they freeze. Hence, keep the outlet open. Soft tile crumble at the outlet, due to the sudden, daily freezing and thawing. Tile laid only two feet deep in a wet peat heave in two years so that the plow strikes them in some places.

How Large Should Tile Be?—Nothing less than 4-inch tile, inside diameter, should be used for laterals. The size of the main depends on the fall and the size and springiness of the area.

How Much Fall Do Tile Need?—Two inches in 100 feet is good. The larger the tile, the less fall they require. Many lines of 12-inch tile are level for 1,000 feet, but they must have a free outlet.

Can a Carpenter's Level Be Used for Surveying?—Such a level will tell you whether you have a poor fall or a good one. Unless you have a fall of two feet in 80 rods in the surface of the ground to an outlet three feet deep or more, you should have an engineer set the grade stakes with a surveyor's instrument.

Can Dead Furrows Be Used for Drainage?—A good dead furrow for surface drainage with a line of 4-inch tile for under-drainage is better than a ditch made three feet deep with a capstan plow, and costs only half as much.

What Kind of Outlet Is Needed?—In big valleys, open outlet ditches are necessary; but wherever a ditch less than six feet deep will take the flow, an 18-inch tile with a surface run is better.

How Do Tile Reduce the Surface Water?— By keeping the soil dry enough to absorb the surface water.

When Should We Commence to Plan Our Drainage System?—A year before you expect to start digging. That gives you time to engage a tiling contractor, to get quotations on a carload of tile from several firms and to haul the tile to a neat pile on a dry, convenient spot when other team work on the farm is not pressing.

What Land Should Be Tiled First?—The wet spots in last year's cornfield, where the corn was drowned out. The most unprofitable land on the farm is the spot just dry enough to tempt you to plow it, but just wet enough that you lose two crops out of three. If it were a little wetter you would know enough not to plow it at all.

Why Is Partial Drainage Unprofitable?—Because it may be sufficient to kill the native marsh grass, but not enough to permit anything else to grow there. A twenty-dollar line of tile often pays for itself every year by saving the crop on an acre of land.—*Wisconsin College of Agriculture.*

"Let us never forget that the cultivation of the earth is the most important labor of man. Unstable is the future of a country which has lost its taste for agriculture. If there is one lesson of history that is unmistakable, it is that national strength lies very near the soil".—*Daniel Webster.*

"The farm is the basis of all industry, but for many years this country has made the mistake of unduly assisting manufactures, commerce, and other activities that center in cities, at the expense of the farm".—*James J. Hill.*

It has been clearly recognized by thoughtful leaders among the people of all ages that civilization and permanent progress depend upon the maintenance of the productivity of the soil and that a permanent agriculture is the only hope for a sustained progress in civilization.

WINTER DAIRYING

Many Advantages in Having Dairy Cows Freshen in the Fall — Offers Best Returns to Producers

IN many sections most of the cows freshen in the spring. The more observing and careful dairymen, however, having found that winter dairying has many advantages, are breeding their cows to drop the calves in the fall. The following are some of the advantages of winter dairying:

First, higher prices are obtained for milk and cream. As the usual season for cows to freshen is the spring, milk has always been plentiful during the early summer and scarce and higher during the winter.

Second, milk and cream can be handled in cold weather with less danger of souring, so there is little loss on account of milk returned from the creamery.

Third, the amount of labor on the farm is better distributed throughout the year. If the cows freshen in the spring, they are in full flow of milk and need the best care when work in the fields is most pressing. On the other hand, if the cows calve in the fall and are milked during the winter, the farmer can give them close attention, has more time to study the problem of feeding, and can give his men employment all the year and in that way get better help.

Fourth, the lactation period is lengthened and the amount of milk given during the year increased. Cows that freshen in the spring milk heavily while grass is good, but as the pastures dry up the flow of milk falls off and with the approach of winter the cows are nearly dry. If they freshen in the fall, they should at once be started on a good winter ration, and when they have been milked six months it is time to turn them to pasture and for a time the flow of milk will be nearly as great as that from fresh cows. Recent investigations by experiment stations verify this observation.

Fifth, fall calves can be raised better than those born in the spring. Young calves should be fed on milk for several months, after which they must be weaned and fed on solid food. If they are born in the spring, they will be tormented by flies all summer, they may be neglected because of the farm work, and when it is time to wean them they must be put on a dry winter ration. Fall calves come at a time when the dairyman can give them the closest attention, and when weaned they can be put on grass at an age when an easily digested and nutritious food is most needed.

As more milk can be produced, higher prices obtained, the labor more evenly distributed throughout the year, and better calves raised, winter dairying offers the best returns to producers.

WHAT IS IT TO BE A SCIENTIFIC FARMER?

WE know that a vast number of the average farmers of this country have a strange distrust of the application of science to farming. In many instances it amounts to a contempt.

We have heard hundreds of farmers say that they "wanted nothing to do with scientific farming". Yet such men must be very shallow and superficial observers of their own business. Take it in machinery. The farm machinery of today, compare it with the rude, crude efforts of 50 to 100 years ago. And still every machine used on the farm is the result of a scientific study of physics. Consider the Babcock test and its tremendous effect upon associated and all other forms of dairying. That was the discovery of a scientific man, a great chemist. Take it in the study of the soil and the application of the commercial fertilizers. Not a single so-called practical farmer in the land ever discovered the nature and uses of nitrogen, potash and phophorus in the promotion of plant life. Agriculture is indebted to the chemist for all it knows on this subject. And so it goes in what we know of the diseases of our domestic animals and the influence of bacteria on their health and vigor. It took a Pasteur and a Koch as well as a host of other scientific men to put us in possesion of knowledge with which to guard and defend our livestock interest.

The practical farmer has been waiting for thousands of years for Professor King with his scientific knowledge to study out a practical system of ventilation for our stables. The farmers were and are still powerless to combat the mighty host of insect enemies that prey on our grains and fruits except for the investigations of science whereby the use of spraying was instituted. And so through the whole range of farming, grain farming, fruit farming and animal farming, are we greatly indebted to the scientist for the fact that we are still able to hold the field.

How cheap and foolish then is this prejudice that so many farmers feel against scientific farming. We are dealing with Nature in her most subtle and intricate forms of expression. We must have the aid of the scientist to save us from the ruination of our own business.

Now any man of average intelligence can become a scientific farmer if he will but inform himself of the conclusions of science. He need not be a chemist to know a lot about the conclusions of soil chemistry or plant and animal chemistry. All he needs to have is a fair education and a reading, studious mind. The mind, the understanding, the judgment "grows by that which it feeds upon", just the same as do the plants and the bodies of all animals.

If a farmer gives his mind no strength or study on these things, he has no thought or judgment concerning them, that is worth anything. The art of farming we learn with our hands; the science of farming we must learn from the investigations of men of science.—*Hoard's Dairyman.*

PORK PRODUCTION

VERY interesting data concerning the cost of wintering brood sows and the cost of growing and fattening pigs are given in Nebraska Agricultural Experiment Station Bulletin 147, which is a report of the North Platte Substation.

By using a large amount of alfalfa hay with a limited amount of grain the net cost of wintering old brood sows is kept at the low figure of $1.25 each without allowing the sow to become too thin for the best results in raising litters. On a ration containing from one-fourth to one-third alfalfa hay, young brood sows are carried from the pasture fields to the farrowing pens at a small profit and in suitable condition for farrowing and raising fair litters.

The average number of pigs per litter raised from old sows during a period of four years was 6.55, at a cost of $2.11 per pig weighing 50 pounds. The average number of pigs raised by young brood sows during a like period was 6.2, at a cost of $1.68 per pig weighing 50 pounds. The fall pig was grown to the weight of 50 pounds as cheaply as the spring pig.

When grazing on alfalfa pasture pigs receiving 2.5 pounds of grain per 100 pounds of their weight daily have gained 0.75 pound each per day. The rate of gain on alfalfa pasture bore a close relation to the amount of grain fed.

The most suitable supplementary feed to corn for fattening hogs seems to depend on several variable factors. Oil meal, cold pressed cottonseed cake, and tankage rank close together in the profits secured in nearly all tests. In some tests these by-products give faster gains and more profit than corn and alfalfa, and in other tests the reverse is true. The physical condition of the hogs as influenced by weather and other factors seems to determine whether alfalfa hay or such a by-product as those just mentioned is the most profitable to feed with corn for fattening hogs.

Ground wheat either soaked or moistened gives faster gains with less grain for 100 pounds of gain than corn, but corn gave faster gains with less grain for 100 pounds of gain than whole wheat either soaked or dry. Soaking wheat increased its feeding value only slightly, but grinding the wheat increased its feeding value about one-fifth.

For growing pigs on alfalfa pasture and fattening them when having access to alfalfa hay, a grain ration of corn proved more efficient than a

VIGORA
THE REAL
REMEDY FOR HORSES
VIGORA is used by leading farmers and breeders as a tonic to strengthen horses and cure **broken-wind, coughs, glanders, anemia, worms, skin diseases, etc.**
PRICE 50c A BOTTLE
ON SALE EVERYWHERE
Get all informations from
J. B. MORIN, Wholesale Druggist
QUEBEC, CANADA.

RAW FURS.
ALL QUANTITIES
Why not make trapping profitable by shipping to the consuming market. We can afford to pay you better prices than our out-of-town competitors, as we have direct connections with the leading manufacturers in the world. A trial shipment is all we ask to prove this fact.
WRITE — TODAY — SURE
for
Pricelist — Tags — Market Reports.
MAX WULFSOHN
122-124 W. 26th St., NEW YORK CITY.
Make "NEW YORK" your fur market

SELDOM SEE
a big knee like this, but your horse may have a bunch or bruise on his Ankle, Hock, Stifle, Knee or Throat.
ABSORBINE
TRADE MARK REG.U.S.PAT. OFF.
will clean it off without laying the horse up. **No blister, no hair gone.** Concentrated—only a few drops required at an application. $2 per bottle delivered Describe your case for special instructions and **Book 8 K free. ABSORBINE, JR.**, antiseptic liniment for mankind. Reduces Painful Swellings, Enlarged Glands, Goitre, Wens, Bruises, Varicose Veins, Varicosities, Old Sores. Allays Pain. Price $1 and $2 a bottle at druggists or delivered. Manufactured only by
W. F. YOUNG, P.D.F. 134 Lymans Bldg., Montreal, Can.
Absorbine and Absorbine, Jr., are made in Canada.

Top Prices for Your Furs
Any firm could use a heading like that, claiming that they pay more. So send a single trial order to us and find out for yourself how much more we pay you for your work.
We Get Them and Give Them
We get higher prices because of dependability and our close connections with the European market, where we have four branches. Europe is producing few furs, and America must supply them. We pass on these higher European prices in higher prices to those we buy from. You get a check by return mail when you send furs to us. If you wish it, we hold your furs separately in cold storage until you say the amount is satisfactory.
These Prices Will Surprise You
Send for our new price list. Compare our grading and prices with what you have been getting. Prove us with a single trial shipment. You will wish you had discovered us before.
Write for book on Successful Trapping, sent free. Don't delay. 11
TRAUGOTT SCHMIDT & SONS
229 Monroe Ave., Detroit, Mich.
Moscow—Paris—Leipzig—London

GILSON
Johnny-on-the-Spot
THIS GASOLINE ENGINE $47.50
Large, generous construction throughout. Simple understandable adjustments. Light fuel and oil consumption beautiful design—thoroughly tested—ready to start when gasoline and oil is supplied.
Write for circular and prices. Gilson Mfg. Co "17 York St., Guelph, Can."

grain ration of two parts corn and one part shorts.

Experiments in cooking alfalfa hay for hogs indicate that the feeding value of the alfalfa may have been increased slightly by the cooking but not sufficiently to offset the extra cost.

The summary indicates among other items that with corn valued at 60 cents per bushel the cost of feed alone for producing a pound of pork is about 5 cents.

FISH SCRAP AS FERTILIZER

Extensive Demand for Commercial Fertilizer — Financial Difficulties

ARTIFICIAL fertilizers are meeting with an increasing demand in America. This, added to the sudden shutting off of the supply of German potash, has focussed the attention of the governments of the United States and Canada upon their respective sources of commercial fertilizers. The three elements chiefly sought are phosphates, potash and nitrogen. These ingredients in varying proportions are used by farmers as fertilizers or "soil amendments."

One excellent source of potash and nitrogen and to a lesser extent of phosphates is fish scrap. This material is manufactured from the offal at canneries and other fish curing establishments. As yet but a comparatively small proportion of the waste in connection with the fisheries is utilized, owing chiefly to the economic problems of manufacturing. The fish reduction industry is carried on only for a few months each year and, as a result, the capital invested is unproductive for a considerable portion of the year. To overcome this, efforts have been made to couple the industry with some other that would make it possible for the plants to be kept in operation for longer periods—possibly for the full year. In this connection, the work of the Federal government at Clark harbour, Nova Scotia, is worthy of note. For several years, the Department of Marine and Fisheries operated a fish reduction plant there chiefly to provide a market for the dog fish which infested the neighbouring waters. During the past summer the plant was placed under the control of the Department of Agriculture and extensive experiments were undertaken to ascertain the possibility, commercially, of utilizing the extensive kelp beds found off the southern coast of western Nova Scotia. The investigations, while not complete as yet, show much promise. These kelps, rich in potash and nitrogen, make excellent fertilizers. If, by combining the kelp industry with the fish scrap industry, the two can be placed on a commercial basis, a very serious waste will have been turned to excellent account.—A. D. in "Conservation".

RAT DESTRUCTION

A Nebraska correspondent writes that cats and poison have failed to kill rats on his farm.

Poisoning is generally the easiest way to kill rats. Perhaps our correspondent has not used good bait. We suggest that he use some substance of which the rats have not been getting much on his premises. For instance, if they have been disturbing the grain mostly we would say, use some meat bait, such as wienerwurst, cheese, or a bit of fish. Sulphate of strychnine crystals in any of these substances makes excellent bait. Some rats refuse to eat the strychnine baits on account of the slightly bitter taste. For them barium carbonate might be a better poison. With this substance baits are prepared by making a poison dough out of four parts of flour and one part of barium carbonate; spread this on bread, cheese, or any substance which it is thought the rats will like very much, and of which they ordinarily do not get much. Barium carbonate has no taste or smell, and consequently makes a fine rat poison, although it does not kill as quickly as strychnine. Poisoning should certainly prove effective if a little experimenting is done with change of baits or poison.

Trapping rats, while slower than poisoning, is a very certain and satisfactory method. The heavy spring trap known as the guillotine trap is one of the best. These traps are cheap, and when baited with fried bacon, cheese or an ear of corn, and laid near the burrows, will generally do very successful work.

An old-fashioned trap which is said to give good satisfaction is the barrel trap. A barrel is covered with a piece of brown paper, and on the paper cheese, wienerwurst, or any other substance which the rats are fond of is kept for several nights until the rats get into the habit of coming there to feed. Then a cross is cut in the center of the paper and the bait is put on the paper as before. The rats coming to feed fall through the paper into the barrel. It is claimed that hundreds of rats may be caught in this way in a single night.

Wallaces' Farmer

AGRICULTURE IN THE SCHOOL

A. C. True, Director of the Office of Experiment Stations, U. S. Department of Agriculture, has this to say about introducing agriculture into the schools :

The claims of agriculture for use as introductory and co-ordinating science, and its advantages for this purpose over any other subject thus far tried or proposed, may be summarized as follow :

(1) It inter-relates not only the various special sciences but also many other subjects of school study, and thus tends to put the student in harmony with a systematic educational program.

(2) It offers the most serviceable basis for a prompt yet conservative

Will pump 1000 gallons of water an hour

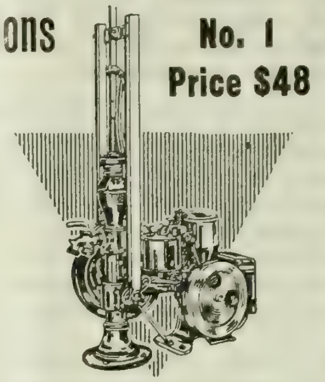
No. 1
Price $48

And pumping is but one of many labor-saving jobs that can be done on any farm with a

Fairbanks-Morse Eclipse Engine

It can be easily moved from place to place and put to work in a few minutes time — grinding, pumping, sawing, hoisting or any other light work of this nature. In fact its uses are practically unlimited.

Strongly built of wear-resisting materials. Simple in design. Economical in consumption of fuel. Fully guaranteed. Made in two sizes.



f. o. b. factory at Toronto.
Complete with pump jack all ready to attach to your wind-mill pump.

Send for interesting, free booklet, "Power on the Farm". Address

20 Fairbanks-Morse Bldg, any branch.

CFM

The Canadian Fairbanks-Morse Co., Limited

Montreal, Quebec, Ottawa, Toronto, Hamilton, Saskatoon, Calgary, Winnipeg, Vancouver, St. John.

CANADA'S DEPARTMENTAL HOUSE FOR MECHANICAL GOODS

"VIVAT" THE SPECIFIC FOR DISEASES OF THE HORSE

"VIVAT" is a most powerful remedy in powdered form, for the treatment of diseases of the horse.
"VIVAT" positively cures Coughs, Heaves, etc.
"VIVAT" is most useful as a diuretic, in Colics and is also effective against intestinal worms.
"VIVAT" fortifies and gives endurance to draught-horses as well as racers.
"VIVAT" is prescribed in severe cases with marked success by eminent Quebec Veterinary Surgeons.

"VIVAT"— Each package contains 12 separate doses, and a box is sufficient for six days' treatment.

Price 50 cents

DR. ED. MORIN & CO., Limited

QUEBEC, CANADA.

FREE FOR THE ASKING

This handsome Fur Style Book (containing 34 pages of illustrations) of beautiful

FURS and FUR GARMENTS

for men, women and children—will be gladly mailed free for the asking—affording you an opportunity to take advantage of our policy of selling furs

From Trapper to Wearer.

We buy our Raw Furs direct from the Trapper and manufacture them ourselves, therefore, we can save you the many profits that usually go to the middleman

WE GUARANTEE
"TO SATISFY YOU OR REFUND YOUR MONEY"

Write to-day for this beautiful Style Book. It will show you how to save many dollars

John Hallam Limited

RAW FURS. *We pay highest prices for Raw Furs. Write for price list if interested.*

GUNS. *We carry in stock a complete line of guns, traps, nets, acetylene headlights and camp lamps "Eveready" flashlights, animal bait, fishing tackle, sportsmen's supplies. Catalogue Free.*

Mail Order Dept. 142, TORONTO, ONTARIO.

re-direction of public school work through a wiser pedagogical organization of the curriculum.

(3) It provides an interesting form of laboratory work and field observation at the beginning of the high school course, thus demonstrating at the outset the fundamental importance of investigational evidence in all science work.

(4) It supplies an economic as well as a cultural motive for science study, and thus allies itself with the spirit of modern educational thought and appeals most effectively to the personal interest of a majority of students.

(5) It tends to develop the student's ability to make a wise choice of personal vocation by bringing the basic industry of farming into conscious comparison with what he knows of other attractive professions and occupations.

(6) It explains and illuminates the fundamental conditions of his own environment and daily life and thus aids in rationalizing the student's experience and in fitting him as an adult for social co-operation in the betterment of community and national life.

(7) It encourages the habit of discovering and enjoying the culture value of every useful subject of study by enlarging the basis of the student's powers of judgment through a broad and sympathetic comprehension of basic social interests.

THE COST OF WEEDS

THE importance of keeping weeds in subjection can not be emphasized too strongly. It is difficult to estimate the damage they do, but it is probable that they cost the American farmer several hundred million dollars every year. In a sense, farming might be called a warfare against weeds. Some farmers emerge from the struggle victorious, while others go down to defeat. So powerful are weed enemies in reducing crop yields, while at the same time multiplying labor, that the farmer should at every turn strengthen his position against them. Bear these invaders in mind in planning the crops and in deciding on the fields to grow these crops, in choosing the implements, in buying seed, and in many other farm activities. Lack of careful planning with reference to weeds is apparent in nearly every community.

It has been shown in experiments with corn made by the United States Department of Agriculture that weed eradication is the principal, if not the only, beneficial result of cultivating this crop after planting. This means that in cultivating the corn crop the implements used should be designed primarily for accomplishing the destruction of weeds in the easiest and cheapest way. It seems to indicate, further, that as weed control becomes more thorough, intercultural tillage of growing crops may be accordingly decreased.

Weeds and Organic Matter

While there are various definitions, a weed may be said to be a wild plant that has a habit of intruding where it is not wanted. Some weeds produce immense quantities of seeds. Some mature seeds in a very short time. Some have seeds difficult to separate from crop seeds. Some have roots or root-stalks that live for a number of years. They persist because well equipped by nature to hold their own. Weeds, however, are not always useless. Sometimes they are the principal means by which organic matter is restored to the soil, and, generally speaking, a soil is productive in proportion to the quantity of organic matter it contains. Turning farm land out to rest merely means that weeds are permitted to grow on it for several years. Weeds are also useful at times in preventing soil erosion, especially during the winter months, and serve a useful purpose in collecting and holding the nitrates and other soluble salts during periods when crops are not being grown, thus preventing these valuable nutrients from being washed out of the soil. Ordinarily, however, all these benefits may be realized through proper rotations, in which case it is a serious mistake to allow weeds to grow.

Damage Due to Weeds

The full reason why weeds reduce yields is not definitely known. It is well recognized that weeds deprive crops of moisture, plant food, and sunlight, and by these means cause decreased yields. Experiments have shown, however, that even where there is a supply of moisture and plant food sufficient for the needs of both the weeds and the crop, weeds still exert a detrimental effect. This may be due in part to the weed roots giving off substances which are poisonous to crops. The fact that weeds do harm in more ways than has been supposed is all the more reason why the farmer should make strenuous efforts to subdue these invaders. Land that should produce 60 bushels of corn may yield no more than 20 bushels if weeds are not kept down by adequate cultivation. Wheat containing wild-onion bulblets is sometimes docked as much as 50 per cent, and in some cases there is no sale at all for such wheat. The agricultural experiment station of Minnesota estimates that in that state alone the damage to wheat due to weed seeds amounts to two and a half million dollars yearly.

The harvesting and curing of crops are sometimes made difficult by the presence of weeds. Russian thistle, bindweed, and Canada thistle usually are a source of great annoyance at harvest time to the growers of small grains. Again, some weeds harbor fungous and insect troubles which attack near-by crops. Furthermore, some weeds are poisonous or otherwise injurious to man, live stock, or live-stock products. Poison ivy, sumac, jimson weed, and the seeds of corn cockle are poisonous to man; wild onion and bitterweed spoil dai-

GOLD DUST
MADE IN CANADA
—its use is second nature
in millions of homes

Gold Dust really *works.* Millions of women know how Gold Dust does the hard work of washing dishes, scrubbing floors, and washing woodwork—

But not *all* of these millions of women realize that Gold Dust is the *only* washing and cleaning powder needed in any home.

Gold Dust cleans metal work, nickel, enameled ware, aluminum vessels, etc., without scratching or marring the polished surface.

Use it for washing bathtubs and bathroom fixtures, cleaning and brightening pots, pans and cooking utensils, cleaning and freshening linoleum and oilcloth, washing glassware—in short, use it to clean and brighten everything.

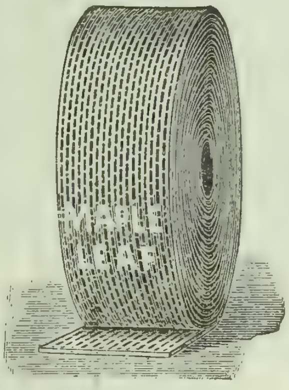
5c and larger packages sold everywhere

"Let the
GOLD DUST TWINS
do your work"

THE N. K. FAIRBANK COMPANY
LIMITED
MONTREAL

Chiclets
Make a Corner Cosy
Collect the Cushion Cover Coupons with every Chiclet Package
Chiclets
FAIT AU CANADA

Ontario Business College
BELLEVILLE, ONT.
49th Year.
O. B. C. training qualifies you for the highest business career.
SEND NOW for the convincing catalogue to
Principal J. W. JOHNSON, F.C.A.



"MAPLE LEAF"
Stitched Cotton Belting

A BELT that is the most economical, truest running and strongest belt on the market. Being thoroughly waterproof it is particularly well adapted for general farm use such as threshing machines, gasoline engines and other farm machinery. Also suitable for saw mills, flour mills, etc.

ASK FOR "MAPLE LEAF" BELTING
IT IS CHEAPER THAN RUBBER OR LEATHER BELTING.

DOMINION BELTING CO., LIMITED
HAMILTON, ONT.
Montreal Office:—50 Notre Dame Street W.

The one best all-around gun—for ducks, geese, foxes, for trap shooting and all small game—is the 12-gauge, 6-shot

Marlin
Repeating Shotgun

The Safest Breech-Loading Gun Built.

It handles fast, hits hard and is a wonderful game getter!

For snipe, quail, partridge, woodcock, squirrels, rabbits, etc., the 16 or 20 gauge has the power of the 12-gauge without the weight.

It's a fine, quick gun of beautiful proportions, superbly balanced, with every up-to-date feature: **Hammerless; Solid Steel Breech,** inside as well as out; **Solid Top; Side Ejection; Matted Barrel; 6 Quick Shots (5 in 20-ga.); Press-Button Cartridge Release; Automatic Hang-Fire Safety Device; Double Extractors; Take-Down; Trigger and Hammer Safety.** It's just the gun you want!

12-16-20-Ga. Repeaters with Visible Hammer, $21.60

Send 3c postage for complete catalog of all Marlin repeating rifles and shotguns.

The Marlin Firearms Co.,
81 Willow St., New Haven, Conn.

ry products; cowbane, water parsnip, and loco weed are poisonous to stock; and the barbed seeds of squirrel-tail grass and porcupine grass penetrate the noses and mouth of live stock, causing painful sores.

It is possible for a farmer, especially if he follows a good rotation, to make his farm almost weed free. Many men, however, make a start to clear their farms of weeds, but quit too soon. Often the campaign is stopped when success is in sight; but the weeds soon recover. Clearing a farm of weeds, especially perennials, is no easy task; it requires more than average intelligence and perseverance. If, however, one outlines a plan of attack and faithfully sees this plan through to a finish, he can practically rid his farm of weeds without a great amount of labor and expense.—*Farmer's Bulletin* 660, *U. S. Dept. Agr.*

AIDS IN POTATO PRODUCTION

(1) A more liberal use of potato seed will generally result in both increased production and profit.

(2) A good storage place is essential in order to insure sound, firm seed at planting time.

(3) The use of high-grade seed would increase the returns from the potato crop of the country by many millions of dollars.

(4) All seed should be treated with formalin before planting to prevent scab.

Results in an oat-smut campaign in Indiana last year showed that where the seed was treated less than 1 per cent of smut was found, while fields sown with untreated seed had an average of 13 per cent. From 1 to 80 per cent of smut has been found in Indiana fields, showing that many have at least one-third smutted heads. The formalin treatment of seed oats increased the yield from 1 to 25 bushels per acre. One out of 80 farmers treated their seed oats two years ago, but, as a result of these campaigns, 5 out of 80 treated their seed oats this year.

Scientists are now convinced that the moon has no more influence on crops than it has upon the temperature or the amount of rain or the winds or any other weather element. The growth of plants depends upon the amount of food in the soil and in the air that is available for them and upon temperature, light, and moisture. The moon obviously does not affect the character of the soil in any way, neither does it affect the composition of the atmosphere. The only remaining way in which it could influence plant growth, therefore, is by its light. Recent experiments, however, show that full daylight is about 600,000 times brighter than full moonlight, yet when a plant gets 1-100th part of normal daylight it thrives little better than in absolute darkness. If 1-100th part of normal daylight is thus too little to stimulate a plant, it seems quite certain that a 600,000th part can not have any effect at all. It is therefore a mere waste of time to think about the moon in connection with the planting of crops. The moon, say the scientists, has nothing more to do with this than it has to do with the building of fences, the time for killing hogs, or any other of the innumerable things over which it was once supposed to exert a strong influence.

The first investment in raising pork is small and the pig is a quick money maker on the farm. He multiplies rapidly, and if we only furnish him good pasture, grazing crops, pure water, and a little concentrated feed he will rapidly gain weight at a small cost.

Many now realize the fact that the growing of pasture grasses and forage crops that make healthy, vigorous hogs of good quality is the basic factor in successful pork production. They are raising hogs at a big profit. Of course those who are successful realize the fact that a certain amount of grain feed is needed to grow hogs with a greater profit, but they use this grain only as a supplement to the feeds harvested by the hogs in the pastures and fields.

Sammy was not prone to overexertion io the classroom; therefore his mother was both surprised and delighted when he came home one noon with the announcement, "I got 100 this morning".

"That's lovely, Sammy!" exclaimed his proud mother, and she kissed him tenderly. "What was it in?"

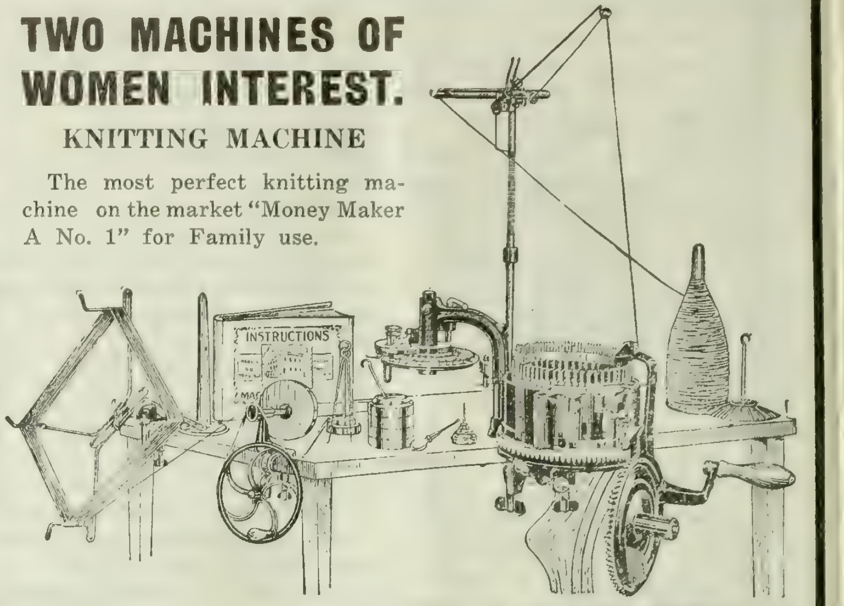
"Fifty in readin' and fifty in 'rithmetic".

Water supply and sewage disposal are most important factors in the comfort of the farm dwelling. Where these permit, however, it is desirable to have the farm-house stand in an open location facing the southwest, so that sunlight may enter all of the rooms during the day. An abundance of ventilation is a necessity, and in most sections of the country the addition of sleeping porches will be found well worth while. The bedrooms should be large enough to allow each person at least 500 cubic feet of space, and preferably 1,000. In the construction of barns, it may be added, not less than 600 cubic feet should be allowed for each 1,000-pound animal.

TWO MACHINES OF WOMEN INTEREST.

KNITTING MACHINE

The most perfect knitting machine on the market "Money Maker A No. 1" for Family use.



"Improved Raymond" and "White" the sewing machines sold at moderate price with complete guarantee.

Please, Ladies, let us send you our Catalogue and you will be pleased with it.. Write to-day.

P. T. LEGARE
LIMITED
273 St. PAUL Street, - QUEBEC

TO ALL SUBSCRIBERS
OF
THE JOURNAL OF AGRICULTURE

the management of "Le Canada" offers a yearly subscription of its Weekly Edition french, at the special price of **50 cents.**

This advantageous offer will last only till the 1st of January 1916 next.

The Weekly Edition of "Le Canada" is published every Thursday, at 12 pages and contains a recapitulation of all the news of the war and most important events of the week.

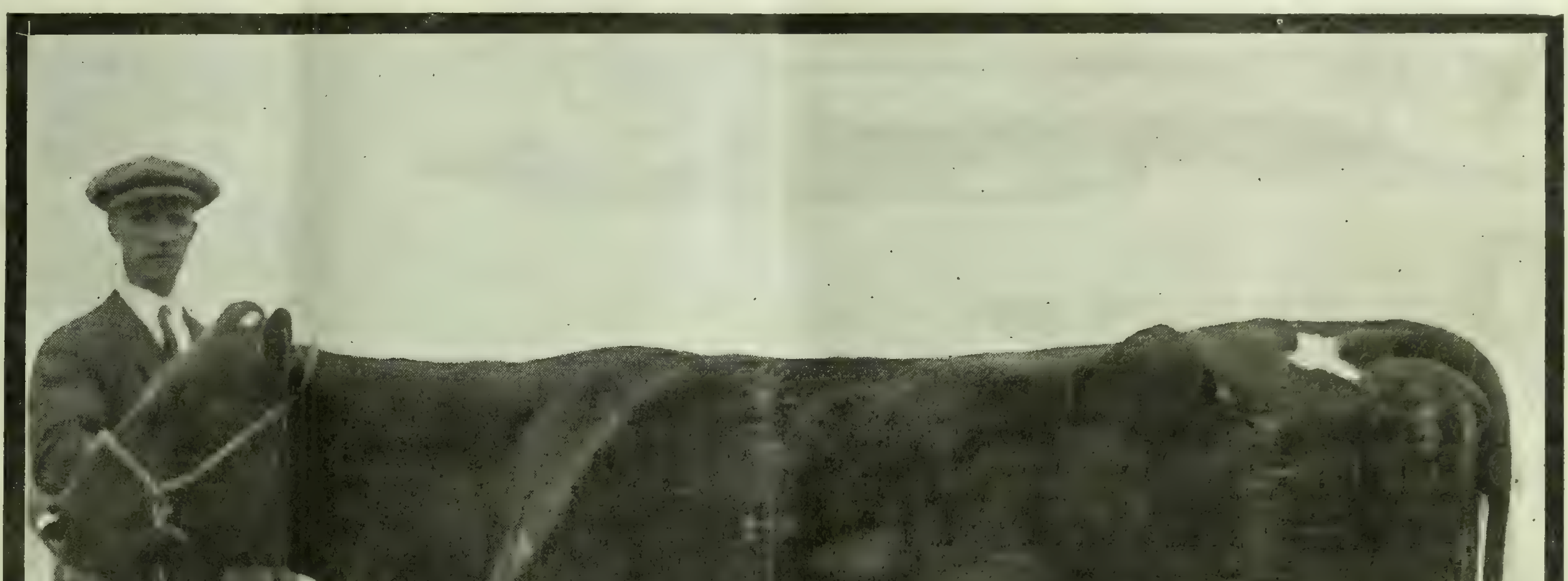
Would be pleased to mail a copy upon request.

CANADA PUBLISHING CO.
73 St. James St., - Montreal

The JOURNAL of AGRICULTURE

AND HORTICULTURE

Volume 19 *December 1st 1915* *Number 6*

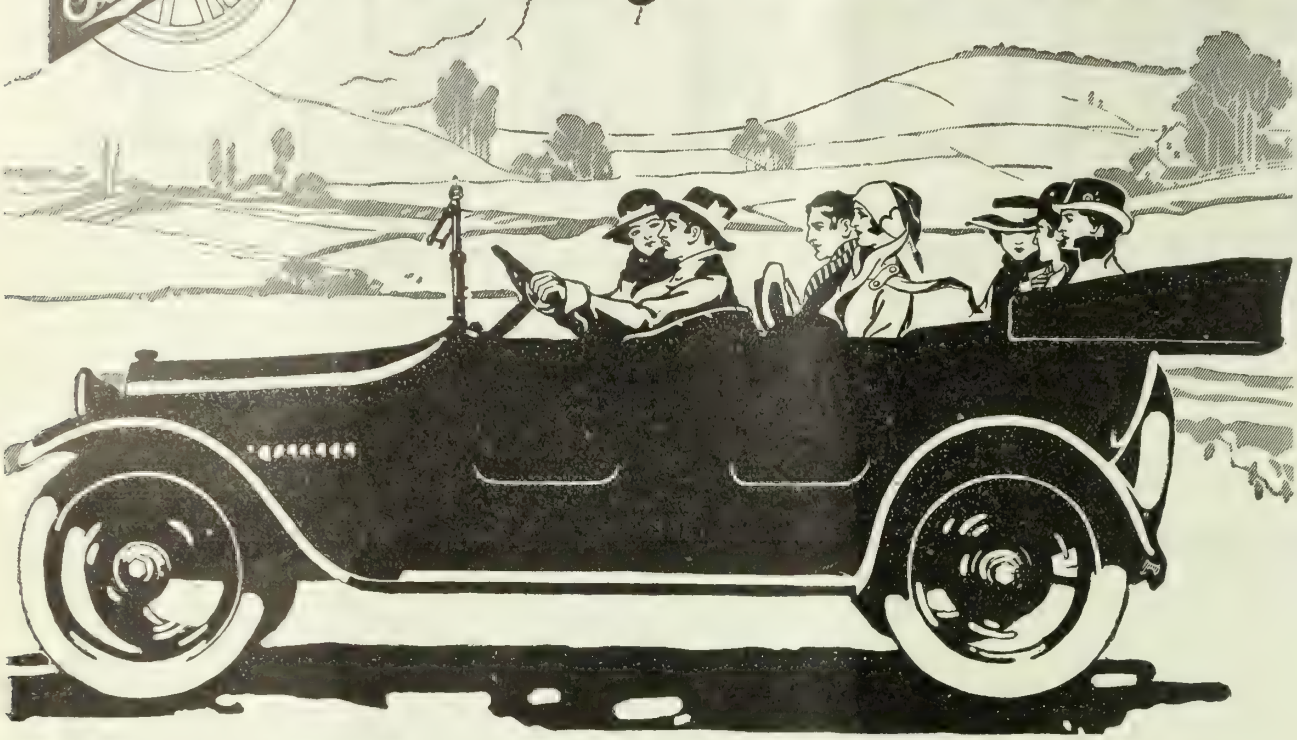


NANCY WAYNE, RIVERSIDE 3rd—A PROFITABLE HOLSTEIN IN THE MACDONALD COLLEGE HERD

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

Studebaker

FORTY Horse Power
7 passenger FOUR $1195



Power
- no car at the price has SO MUCH

Without a single exception, this new Studebaker FOUR at $1195 is the MOST POWERFUL car ever offered in Canada at its price. Its motor, INCREASED in size from 3½ x 5 inches to 3⅞ x 5 inches, develops FULL 40 horse power. And the scores of improvements that have been made in the motor design, the high location of the carburetor, the 6-inch intake, the scientific design of the manifolds, make it not only far more responsive than ever before, but vibrationless and economical to a surprising extent.

In POWER and flexibility, this Studebaker FOUR equals most of the Sixes on the market. And in VALUE, dollar for dollar, it completely outclasses every other 4-cylinder car. For Studebaker has set a new standard of VALUE for Fours. Studebaker has lowered its price $55—coming down from $1250 to $1195—and still INCREASED its POWER, size and quality. And wherever materials have been changed, BETTER materials have been used. The upholstery, for example, is the finest, hand-buffed, semi-glazed leather purchasable,

It is the GREAT 4-cylinder value of the year—a car you can depend on—a "built-in-Canada" car that stands up in every emergency. We urge you to see it before you decide on any car. The 1916 catalog will be mailed on request.

STUDEBAKER
Walkerville, Ont. Dept. F 45
More than 200,000 Studebaker Cars now in Use

Four Cylinder Models
Touring Car, 7-passenger $1195
Roadster, 3-passenger - 1165
Landau-Roadster, 3-pass. 1495

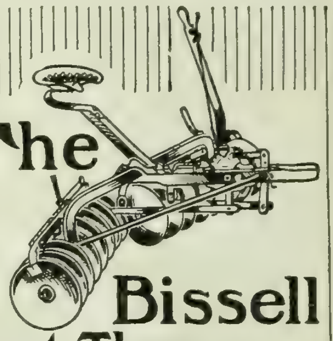
Six Cylinder Models
Touring Car, 7-passenger $1395
Roadster, 3-passenger - 1350
Landau-Roadster, 3-pass. 1695
F. O. B. Walkerville

JOINT AYRSHIRE BREEDERS SALE
to be held at 10 a.m.,
THURSDAY DECEMBER 16, 1915
at the Canadian Pacific East End Stock Yards, Montreal.
ABOUT 80 HEAD OF AYRSHIRE

Cattle from the celebrated herds of the Hon. Senator Owens, Montebello, Que., W. F. Kay, M.P., Phillipsburg, Que., and the Vaudreuil Dairy & Stock Farm Limited, Vaudreuil Station, Que., will be offered for sale at auction.

Every animal will be registered in the Canadian National Records, and transfer and certificate of health will be delivered to each purchaser.

ANDREW PHILPS, Auctioneer.
Catalogue may be had from the secretary,
A. E. D. HOLDEN, Room 805, McGill Bldg.,
211 McGill Street, Montreal.



The Bissell Out-Throw Disk Harrow

To settle all doubt about which is the BEST OUT-THROW DISK HARROW, we ask you to test the "Bissell" Out-Throw in a field competition with other Out-Throw Harrows.

The "Bissell" Out-Throw has many features that have made the name "Bissell' famous in connection with Disk Harrows. It has plates of the correct shape. One gang is set slightly ahead of the other. The gangs cannot crowd or bump together and cause the Harrow to rock when you come to hard soil—a new feature in Out-Throw Harrows. The hitch is well back, the draught is light and there is no neck weight.

The machine in actual use is our best advertisement. No need to send special travellers to sell the "Bissell." We put our name on every Harrow. If you would like to learn more about Disk Harrows, send to Dept. J.A. for free booklet of both out-throw and in-throw styles. 72

T. E. BISSELL CO. LTD.,
ELORA,
ONT.

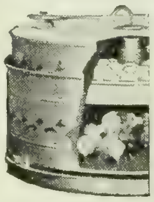
Shippers and Trappers
We Buy for Cash and Pay Highest Prices for all kinds of FURS

Send today for our Free Price List and let us prove to you that we actually pay more than any other house for Fine Fox, Mink, Marten, Rat, Lynx, Wolf and all other Furs, Hides and Ginseng.

We offer you best facilities in America for handling all your furs. Send for Free Price List and Shippers' Tags. No commission charged.

ROGERS FUR COMPANY, Dept. 282 St. Louis, Mo.

PHILO'S CYCLE HATCHERS
Beware of Imitations
GREAT REDUCTION IN PRICE for 30 DAYS



Brooder-Hatcher two perfect working machines in one $6.00 f.o.b. Canada. Six machines $30.00. Philo's Cycle Hatchers the only genuine make. 30 day offer $4.00 each f.o.b. factory for one or more. Our Cycle Hatchers were the only machines that hatched every egg in an incubator contest with all other machines. My FREE Catalogue illustrates and tells all about new discoveries and the latest improvements in Philo System appliances. Philo System Book with right to use patented appliances $1.00 postpaid.

E. W. Philo-1639 Lake Street, Elmira, N. Y.

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 96,253
ENGLISH, 9,820
FRENCH, 86,433

Volume 19 DECEMBER 1st 1915 Number 6

EDITORIAL

NOTICE TO AGRICULTURAL SOCIETIES

Election of Members

THE general meeting of members of Agricultural Societies, for the election of directors and the discussion of the report of the year's operations will be held on the third Wednesday in January (January 19th 1916). The Secretaries will announce later the place of meeting.

NOTICE TO FARMERS' CLUBS

Election of Directors

BY virtue of the law of 1915, amending the revised Statutes of 1909 regarding Farmers' Clubs, the general annual meeting of the members of Farmers' Clubs will be held on the second Wednesday in January (January 12th 1916) to elect directors, nominate an auditor, and inspect the accounts for the year.

The Secretaries will announce in good time the place of meeting.

In the case of a Farmers' Club being unable to elect members on this date, the present directors will remain in office for next year.

SHORT COURSES IN AGRICULTURE

THE Hon. J. Edward Caron, Minister of Agriculture, has again arranged for a series of Short Courses in Agriculture from November to March. The courses will continue for a week in each place, and these groups consist of two divisions, as follows:—

In the N. E. part of Quebec, along the lower St. Lawrence.

November 8th, Trois-Pistoles,
" 15th, Notre-Dame du Lac,
" 22nd, Isle Verte,
" 29th, St. Alexander,
December 20th, Bonaventure,
" 26th, New Richmond,
January 17th, St. Alexis,
" 24th, Amqui,
" 31st, Matane,
February 7th, St. Octave de Metis,
" 14th, Rimouski,
" 21st, St. Charles de Bellechasse,
" 28th, Montmagny,
March 7th, L'Islet.

In the S. W. part of Quebec, along the line of the Grand Trunk and Quebec Central railways:—

November 8th, St. Romuald,
" 15th, St. Agapit,
" 22nd, Plessisville,
December 6th, Victoriaville,
" 13th, Danville,
January 10th, St. Gregory,
" 17th, Bromptonville,
" 24th, Weedon,
" 31st, D'Israeli,
February 7th, Tring Junction,
" 14th, Courcelles,
" 21st, Beauceville,
" 28th, St. Justine,
March 6th, Ste. Henedine.

Two sets of competent instructors will be provided, one for each group. This work of instruction is highly commendable, in view of the fact that a great demand has arisen for live stock products. The Minister of Agriculture is desirous of promoting the live stock industry in the province and hopes that increased interest will be aroused among the farmers by means of the Short Courses. It is to hoped that the English speaking people of the various districts who understand French may find it convenient to attend the courses held in the places nearest at hand, even although short courses are being arranged now by Macdonald College for the months of January and February.

CHRISTMAS 1915

> "Heap on more wood, the wind is chill;
> But let is whistle as it will,
> We'll keep our Christmas merry still."—
> Scott.

TO many people, perhaps, the idea of Christmas cheer this year seems almost criminal. No Christmas before has ever been like it. Even last year when we were yet stunned by the terrible events following the fatal 4th. of August the war did not mean to us what it means to-day—the long lists of Canadian casualties had not begun to come, the deadly nature of the European struggle was undreamed of. Why talk, they say, of "peace and goodwill" when these are in danger of being swept from the earth and the birth of that Child of long ago seems almost to have been in vain. But was it? If the Christ Child came to teach a new view of life, the view that truth, unselfishness, honor, courage, kindliness and self sacrifice are greater and to be more desired than might and power, have we not learned some of the lesson? One has only to think of the men daily offering their lives for these ideals with willing hearts and smiling faces, to realize that there have been not a few apt pupils. Deeds of almost incredible bravery and self-sacrifice are being performed with the utmost cheerfulness, the cry of "Are we down-hearted?" brings a mighty "No," even under most trying conditions.

Why then should we at home be gloomy and sad? Burdens are more easily borne by the cheery spirit. Shakespeare wrote:—

> "A merry heart goeth all the way.
> Your sad heart tires in a mile.—a"

a doctrine well worth practising to-day.

Then, too, if we should perhaps feel justified in indulging in sadness on our own account we have no right to rob the children of their joy. Christmas is particularly the children's festival and though they should not be indulged in extravagant pleasures, unwise at any time but quite out of place now, some enjoyment should be provided to mark the season for them and for the lonely, the poor and the sick.

B. P.

THE CHRISTMAS SEASON

IN the midst of war's alarms our thoughts this Christmas time naturally turn to Europe where so many of our young men and women are fighting and working for liberty and the Empire. Some of them no doubt are there to satisfy the spirit of adventure, but most of them, we believe, are there from a spirit of pure unselfishness, willing if necessary to sacrifice their lives for the good of the Empire. Our appreciation of their sacrifice should be shown magnanimously this Christmas. Our gifts which in other years are bestowed upon intimate friends should this year be given to those who are battling for us in Europe.

Let us remember, too, the families left behind and dependent upon those who have gone. They have made great sacrifices and should not be forgotten. Let us, therefore, pour our offerings into the coffers of both the Patriotic and the Red Cross Funds, so that there may be as little suffering as possible.

It may be some time before the dragon that is harrying the earth is slain and made powerless, and until then it is impossible to feel charitable to all people. May that time soon come when we may again give the old Christmas greeting,—"Peace on Earth and Good Will to Men".

ORGANIZATIONS FOR COUNTRY WOMEN

A few years ago the Secretary of the United States Department of Agriculture addressed to six hundred representative farm women a series of questions designed to reveal the conditions under which the wives of farmers lived and performed their daily duties. As anyone familiar with farm life in America might have anticipated, the answers showed that the improvements made in the conditions of rural life had up to the present been of no such wide-reaching benefit to the women as they had to the men on the farm. It was only the men who had profited by mechanical inventions. Very few labor-saving devices had been invented for the benefit of the housekeeper. The formation of agricultural organizations of numerous types had afforded the men opportunities for social intercourse and for a certain amount of

CONTENTS

EDITORIAL.—Notice to Agricultural Societies. —Notice to Farmers' Clubs.—Short Courses in Agriculture.—Christmas, 1915.—The Christmas Season. — Organizations for Country Women.—Better Care of Manure.—Quebec Pastures.

ORCHARD AND GARDEN.—Pomological Society of Quebec.—Report on Fruit Crops.—The Pure Maple Sugar and Syrup Co-operative Agricultural Society. — Give Bees good Winter Quarters.—Care of Begonias.—Ten Years' Profits from an Apple Orchard.—Potatoes Rotting; Store with care.

FARM AND FARM CROPS.—Roots. — Sherbrooke County Ploughing Match.—Report on the State of the Crops.—Seasonable Hints.—Fall Treatment of Soil. — Distribution of Seed Grain and Potatoes. — Chateauguay Corn Competition.—New Grades of Seed Grain.—Silver Weed.—How to Tide over the Temporary Shortage of Potash Fertilizers.—How to Build Concrete Tanks.

LIVE STOCK. — Nancy Wayne of Riverside Third.—The Raising of Hogs and the Bacon Industry.—The Trend of the Live Stock Situation in Quebec.—Sixth Annual Sale of the Stock Breeders' Society.—Sale of Pure Bred Sheep at Sherbrooke.—Some Flocks, Herds and Farms of the Bedford District.—Great Ayrshire Field Day.

DAIRY.—Is the Milking Machine efficient?—Cow Testing Notes.

POULTRY.—Free Course to Poultry Raisers.—Dressed Poultry Standards. — Winter Egg Production.

WOMAN'S WORLD.—Dunham Homemakers' Club. — Short Course in Dressmaking. — Foods and Food Preparation.—Candy.

GENERAL INTEREST : — Jack's Mother. — Improving the Lawn.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

"Public prosperity is like a tree. Agriculture is its root; industry and commerce are its branches and leaves. If the root suffers, the leaves fall, the branches break, and the tree dies".—*Chinese Philosophy.*

travel. No corresponding facilities had been afforded the other sex, whose need for sympathetic society is much greater. The occurrence of insanity among the isolated women of our own prairie provinces is unfortunately only too common. It is believed that sheer lonesomeness is the fundamental cause.. This is, indeed, the outstanding tragedy of Canadian rural life.

The organization of women's societies, which has now been undertaken in practically every province of the Dominion, is the first effectual step taken towards the relief of the farm women's burden and isolation. The deep interest and the efficient attention that is being devoted to this enterprise will be realized by anyone who looks through the reports from the various provinces collated in the September issue of the Agricultural Gazette. To the officers and members of our Homemakers' Clubs, and to those contemplating the organization of such clubs in their own communities these reports will be of special interest. They are full of suggestions for the work of women's clubs in rural districts, suggestions which are the outcome of the best Canadian experience in this work.

The Quebec reader will be proud to note the influence which Macdonald College is exerting in this work. Miss DeLury, Director of Homemakers' Clubs for the University of Saskatchewan, was a member of the original staff of Macdonald College. Miss Fraser and Miss Carlyle, who report respectively for Nova Scotia and Alberta, received their training at Macdonald, as did also Miss Campbell who has charge of the work among the English speaking people of this province. Macdonald College is evidently doing its full share in this progressive movement.

BETTER CARE OF MANURE

CANADA is expected next year to repeat or to exceed her performance of this year. Greater and still greater production is needed as the tension is gradually becoming greater in Europe. While the Western farmers are raising more grain, the Eastern farmers must give more attention to the raising of stock, and this brings up the question of manure.

Many farmers have been using artificial fertilizers to supplement the lack of manure, but nowadays the usual potash supply is gone since it came from Germany. How then can the farmer secure a supply of potash sufficient for his needs? Our Experiment Stations have gathered much valuable information regarding the value of manure, which is worthy of careful study at this time. The Wisconsin Station Bulletin 200 places the total value of the manure from a dairy herd of 50 cows at $2,140—the nitrogen $1,381, phosphorus $211, and potassium $548. As a matter of practice, however, few dairy farmers realize the amount given above on account of losses in the barnyard. The chief loss occurs in the leaching of the liquid excrement. Two-thirds of all the nitrogen and four-fifths of the potassium voided by the animals are in the liquid excrement and so may easily be lost if the liquid is allowed to run away. We may state this in another way: More than half of the value of the fresh manure is in the liquid.

Is there a practicable way of conserving this precious liquid? Yes. Use plenty of litter to absorb the liquid, have concrete gutters in the stable, and haul the manure directly to the field. If, however, the manure has to be stored for a while a special place should be built which has a water-tight floor and a cover to turn most of the rain. To prevent loss from hot fermentation it is only necessary to keep the pile compact and moist.

It has been shown that eight tons of manure have given rather better results then over 500 pounds of a very high grade commercial fertilizer, tested on a four-year rotation of corn, oats, wheat and clover.

One fact stands out clearly when these results as well as those of our own stations are studied, —that there need be little fear of potash starvation so long as there is abundance of manure and care is taken to conserve it properly. The European countries are more careful of manure than Canada is, and we can learn much from them regarding methods of conservation. The Belgian farmer has a proverb: "No crops, no cattle; no cattle, no manure; no manure, no crops." Agriculture is most successful in those countries where animal manure is most appreciated. So intimate is the connection between manure and efficiency in soil management that it is a common saying in some countries: "A farmer's wealth is measured by the size of his manure pile, and the care he takes of it."

QUEBEC PASTURES

QUEBEC is becoming a dairy province, but one prominent factor in the continued success of the industry is the quantity and quality of the pastures. Along the St. Lawrence the soils are admirably adapted to the growth of grass and hay and the province has long been noted for the large exports of hay. Of late years, however, the yield per acre has appreciably diminished, a result due to the decreased fertility of the soil through continuous cropping and to the increasing prevalence of weeds. As a consequence a larger number of farmers have turned their attention to dairying with the two-fold object of bringing back fertility to the soil and of introducing some system of rotation of crops to check the weeds.

The problem of improving the pastures so as to make them yield more forage for milk production is therefore an important one and is deserving of more attention than is usually given to it. In the first place attention should be given to the matter of better treatment of pastures. As a rule cattle are turned in too early in the spring before the plants have a fighting chance to live. The grasses should be allowed to grow to a height of four or five inches before they are disturbed, for it should be borne in mind that it is the leaves which make the food of the plant, and if these are not allowed to develop growth is prevented. By permitting the leaves, therefore, to grow undisturbed in the spring until they are four or five inches in length the grasses will grow very much faster than if they are only an inch or two in length when the cattle are turned in.

Again, as a rule pastures are kept too closely grazed. The grasses are unable to make much leaf surface and thus become weakened. Weeds gradually take their place and the amount of forage produced becomes gradually less.

Many farmers are attempting to grow grass year after year without making any efforts to reutrn to the pastures the fertilizing constituents that have been removed. They fail to realize the fact that when pastures produce crops they demand fertilizers like other crops.

The droppings of the animals are not sufficient to restore the balance, besides these are unevenly distributed and often lost. There is little wonder, then, that pastures treated in this way for many years are run out and yield but little forage.

With regard to the improvement of the pastures, much depends upon their condition. If they are worn out the best plan is to break them up if they can be plowed, to manure and fertilize them, and to grow a corn or root crop to kill the weeds before re-seeding. Where it is impossible to plow, a harrow can often be used to advantage in re-seeding and spreading the manure. In re-seeding a mixture of grasses and clovers should be sown. The following mixture per acre is recommended:—Orchard grass 4 lbs; meadow fescue 4 lbs; timothy 3 lbs; tall oat 2 lbs; meadow fox-tail 2 lbs; alfalfa (Grimm) 5 lbs; alsike 3 lbs; white clover 2 lbs. The manures should be supplemented with ground limestone and acid phosphate,—the two latter in the fall and the manure in the spring.

THE GARDEN AND ORCHARD

POMOLOGICAL SOCIETY OF QUEBEC

THE Annual Meeting of the Pomological Society of Quebec will be held at Macdonald College, December 9th and 10th.

PETER REID,
Secretary

REPORT ON FRUIT CROPS

(*By the Quebec Arboricultural Service.*)

Montreal Region:—The apple crop would have been half that of last year had not the hurricane of 26th Sept. caused the fall of 40 per cent. of the fruit. Taking from this percentage 25 per cent. for loss in quality, the average of the marketable crop is thus reduced to one-quarter that of 1914.

In districts where the fight against insects was steadily kept up, notably in Rouville, apple raisers will be able to put in store some thousands of barrels and boxes of very choice Fameuse and McIntosh apples.

Quebec Region:—The apple crop is only one-half that of last year. Frequent showers with alternating heat, which we had at the beginning of the month, the wealthy apple ripened too fast, and have almost all fallen from the trees.

On the other hand, the Fameuse are much more plentiful and of finer appearance than usual. The St. Laurent is very scarce.

At this writing, third quality apples are selling for $3.00 a barrel, while choice Fameuses fetch $7.00.

In the Gulf counties the apple crop would have been very heavy if the orchards were larger. The varieties Yellow Transparent, Duchess, Wealthy, Baxter and Salome have come on finely, although the orchards in general receive but little care.

In the Counties of L'Islet and Kamouraska the plum crop is as abundant and fine as that of last year. Unfortunately, the growers have been unable to market their crop at remunerative prices, for, although some of them managed to place choice varieties, early in the season at from 15 to 30 cents a gallon, the majority of growers cannot now obtain more than 10 cents a gallon.

THE PURE MAPLE SUGAR AND SYRUP CO-OPERATIVE AGRICULTURAL ASSOCIATION

THE report of the proceedings of the third annual meeting of the Maple Sugar Co-operative Association was mailed to members with a circular from the Secretary, Mr. J. H. Lefebvre, Waterloo, dated November 15th. The report, which may be had in English and French, contains the full text of the addresses of Messrs Lefebvre, Grimm and Snell and a brief report of that of Mr. Gustave Boyer. M.P., the new President.

The membership list in the report totals about 460 and according to the circular it is now nearly 500. About 20 tons of maple goods were handled for the members last spring, the prices for the three grades of syrup averaging $1.15, $1.05 and 0.95 a gallon and those for the two grades of sugar 11 cents and 9½ cents a pound. The charges for handling, storage and insurance amounted to 5 per cent of gross receipts. These expenses can scarcely be diminished until the association is large enough to own a warehouse. Mr. Lefebvre thinks this out of the question as long as the membership is less than 1000.

Mr. Lefebvre's circular states that large orders for maple sugar are coming from England and France, which cannot be filled from the stock in sight. Any of our readers who have sugar or syrup still on hand would no doubt find it to their advantage to communicate with Mr. Lefebvre, as present prices are exceptionally high. The market is now very bare and the demand is increasing. The European market is a new feature in the situation and the removal of the duty on sugar going into the United States will no doubt greatly increase the demand for good quality goods from that quarter.

The circular draws attention to the new law which not only prohibits the use of the word "maple" on other than genuine goods but also forbids the manufacture of imitations. The fines for infraction of this law range from $25 to $500 and one-half the fine goes to the informant. Persons having information of any infractions of the law are urged to communicate it to the association.

GIVE BEES GOOD WINTER QUARTERS

THE winter losses of bees are great every year. Beekeepers can reduce these losses by preparing their bees for winter and giving them good winter quarters.

The chief known causes for winter losses are queenlessness, lack of numbers in colonies, insufficient food, poor food, dampness, lack of air, the breaking of clusters, and low temperatures.

A queenless colony will certainly die in a few months.

If the number of bees in a colony is small, the cluster cannot generate enough heat or keep the heat it generates and the bees freeze. In the fall small colonies should be united into one big colony.

Bees must eat in the winter in order to generate heat. They must have about forty pounds of honey when they go into winter quarters. If they are short, they should be supplied early with finished frames or fed sugar syrup. Dark (not amber) honey is poor food for bees to winter on. All black honey should be removed and combs of white honey should be inserted.

Dampness in a cellar causes the combs and frames and the hive walls and cover to get wet and mouldy, and the bees perish from wet cold. Bees need fresh air. Foul air will cause excitement, and the bees will scatter and die. Excitement among bees in winter is fatal.

The present style of Hoffman frame divides the bee cluster in winter into eleven spaces, and the bees are unable to pass from one space to the other. When the bee cluster contracts during the winter, those left on the outside frames die. Some beekeepers perforate their frames for the easy passage of bees from one compartment to another. If kept in a warm place they can pass over or around the frames. In long-continued and severe cold the bees may not be able to move along the frame and they will sometimes die of hunger within an inch of the honey supply.

Bees should be kept in a cellar at a temperature of about 45 degrees. Very strong colonies, however, will survive almost any degree of cold. In hives well protected with leaves, excelsior, or shavings, bees have wintered in Minnesota very successfully, especially in sheltered localities.

Cellar wintering is at present general. But the bee-keeper should be sure to have a warm, dry, dark, well-ventilated cellar for his bees and they should not be disturbed during their winter sleep.

With the best of care many colonies are lost every winter, which shows that there is still a great deal to learn about the best conditions for wintering.—

THE CARE OF BEGONIAS

THERE are many kinds of Begonias that may be grown in the home, especially if kept in a bow window facing East and South. The most popular varieties for home culture are *Begonia Cocinnia*, with glossy green leaves and scarlet flowers; *Begonia Fuchsioides*, so called because the scarlet flowers resemble a fuchsia; *Begonia Nitda*, with glossy green leaves and beautiful white flowers; *Begonia Haagianna*, with large leaves and a profusion of bloom. *Begonia Incarnata*, or Christmas Pink, requires more care and thrives best in plenty of light and sunshine. There are several other varieties, but most of them require the same treatment.

During winter months these plants should be watered very sparingly, as too much water is likely to be harmful. Begonias are gross feeders, and should be fed at least once a week with fertilizer, especially during the growing season. Some of the best fertilizers on the market are Bon Arbor, Clay's Fertilizer, Benora Plant's Own Food. Use a teaspoonful of fertilizer to one gallon of water. The best results are obtained by changing the food every two or three weeks. A pamphlet is usually given with the fertilizer containing explicit directions for use.

Propagation

To grow Begonias from seed is somewhat unsatisfactory; better results are obtained from cuttings, and spring or early summer is the best time for this operation. Cut off a few pieces of the young growth, place them in a pot or flat of sand in a warm room, and keep them watered but not too wet. After they are rooted put them in small pots, and repot as required. Nearly all Begonias will grow in a wide range of soils; two parts loam and a third of equal parts of decayed cow manure and sand will answer the requirements of most of them.

Old plants can be grown year after year if they are cut down after the blooming season. Give them a short rest by withholding the water, but do not allow them to become dust dry, then shake most of the old soil from the roots and repot, adding some good soil.

Begonia Rex

The culture of Begonia Rex and its varieties is very simple, and these plants can be grown for years if given proper care. Propagation is very simple, and is also interesting, as they will root freely from the leaf. Select mature leaves of plants which are growing in a rather cool room; the pieces should be triangular shaped, the part to be inserted in the sand ending with one of the thick ribs or veins which are prominent on the under side of the leaf. Put them in sand to the depth of about an inch, and place in small pots as soon as the new leaves show above the sand. Entire leaves are sometimes used by giving a few cuts across the principal ribs then placing them flat on damp sand. The former method is preferable, as they take up less space.

Begonia Rex can be grown for years by repotting each spring. Shake a portion of the soil from the roots, clean the pot thoroughly, then repot, using good soil.

E. H. JONES

TEN YEARS' PROFITS FROM AN APPLE ORCHARD

U. P. Hedrick, N.Y. Ag. Exp. Station Geneva, (Bull. 376)

THESE experiments were carried out during a period of 10 years in the Auchter orchard near Rochester by the Geneva Experiment

Station. The apple trees are of the Baldwin variety and were 37 years old at the end of the experiment; that is to say they had reached their maximum productivity. The average yield per acre during this period was 116.8 barrels, of which 79.19 were packed for direct consumption and 37.61 consisted of "culls" and "drops" which were dried or made into cider. The proportion of evaporator and cider stock is high, owing to autumn gales in two seasons. The average yield per tree was 4.29 barrels, consisting of 2.91 barrels of marketable apples and 1.38 barrels windfalls. The orchard is valued at $500 per acre, and at 5 per cent the interest is $25 per acre or 21 cents per barrel. Taxes are estimated at $1.50 per acre or 1.2 cents per barrel. The cost of depreciation is not allowed for separately, as it appears in the salaries of the workmen, who provided their own tools. The cost of the equipment for an average orchard, including team, spraying outfit, wagon, plough, etc., would be about $5,000. The annual cost of tillage was $7.39 per acre, and the total cost of cultivation, including cover crop, pruning, spraying and superintendence, exceeds $74 per acre, or $2.7 per tree and 64 cents per barrel. The apples were sorted and packed on the orchard and hauled to a station 1½ miles away. The total cost of these operations was 24.4 cents per barrel. The average price of the barrels has been 36 cents each.

Thus the cost of 1 barrel of apples delivered at the station is calculated as follows:

Interest on capital	$0.21
Taxes	0.012
Tilling	0.063
Pruning	0.03
Spraying	0.96
Cover crop	0.023
Superintending orchard	0.25
Picking, packing, sorting and hauling	0.244
	$1.79

During this period of 10 years the average price of apples was $2.60 including first and second quality, and 72 cents for evaporator and cider stock. Subtracting the cost of a barrel of apples ($1.29) from $2.60 (the selling price), there remains a net profit of $1.31 per barrel, or $103.49 per acre. Since no barrels are required for the culls, the cost per barrel quantity is 93 cents, which, subtracted from the selling price of 72 cents, leaves a net loss of 21 cents per barrel. Multiplying by 37.6, the number of barrels of culls per acre, the loss per acre on the culls is $7.89, thus leaving the average net profit per acre in this orchard at $95.60. Adding to this the $25 interest on the investment, we have $120.60 net or 24.12 per cent on $500 as the annual 10-year dividend.

Although the profits of this orchard are many times as great as those from the average plantation in New York, they are not abnormal for a well-managed orchard in this State.

POTATOES ROTTING; STORE WITH CARE

POTATO-GROWERS in different parts of the country are suffering losses through potato rots, and these losses will increase unless great care is used in storing the crop.

The two types of rot which are most serious are the late blight dry rot and black leg rot. The late blight dry rot appears on the surface of the potatoes as sunken, dark, purplish, or brownish areas. On cutting into these areas the flesh of the tuber is found to be undergoing a dry decomposition. If the air is moist such spots sometimes show white mold. The black leg rot usually gets in at the stem end of the tuber causing a soft decomposition, the margin of the decomposed areas often being quite dark or even black. If the rot gets into the flesh of the potato it may spread faster than on the outside.

For this year the only thing to do is to store the potatoes in dry, well-ventilated, and cold places. A low temperature is essential. Tests have been made with potatoes, the vines of which had been destroyed by late blight, in storage at different temperatures. After two months at 40 degrees, 17 per cent of rot had occurred; at 55 degrees, 53 per cent; and at 70 degrees, 79 per cent. This kind of thing may happen to farmers this year if their storage conditions are not favorable.

Practically all of the loss sustained from late blight rot could have been prevented easily by proper spraying. Where tests have been made over a long period of years, an increase of 105 bushels to the acre has been obtained by spraying from two or four times, and other tests have shown that storage rot has been reduced from 75 per cent on unsprayed potatoes to less than 1 per cent on sprayed potatoes. The spray used is Bordeaux mixture which can be applied with Paris green at very slight expense.

To remove danger from black leg, all potatoes that show evidences of infection should be discarded when seed potatoes are selected in the spring, and after tubers have been selected they should be treated with corrosive sublimate—four ounces to thirty gallons of water.

Corrosive sublimate is a deadly poison and potatoes treated with it should not be eaten by man or fed to stock.

THE FARM AND FARM CROPS

ROOTS.

Harvesting Swedes

Mr. Herbert Cunningham's Method of Topping with a Hoe, Plowing out and Harrowing the Roots

TWO years ago my attention was drawn to a new method of harvesting swedes which is well worth recording. Mr. Herbert Cunningham, one of the progressive farmers in Huntingdon county, claimed, at a discussion on root growing in general, that he was able to save not only time, but a considerable amount of labour, through topping with a hoe, plowing out and harrowing the roots instead of pulling and topping them by the old method.

According to his description he first clears the land of roots, so as to make it possible to turn around with the cart, plow and waggon. Then he commences to top the swedes with a sharp hoe, bent to a convenient angle, leaving the tops between every two rows. The tops are carted away and fed to the cows in the pasture, or made into ensilage. Fresh tops may be fed for at least three weeks by topping a few rows at a time each day, beginning about the 10th of October. The roots are left in the ground until a sufficiently large piece has been topped to make it worth while using the plow.

After the ground has been cleared of leaves an ordinary, preferably "broad-pointed", plow is used for "digging" the roots. The coulter, or knife, is of course removed and the plow is set to cut on the left side and just under the bulb of the roots. The depth is regulated according to the variety. In light soils, and with smooth varieties, many roots will be left without having the tap-roots cut; on heavier soils the majority of the tap roots and prongs are separated from the main bulb by the share of the plow.

Dirt frequently sticks to the roots after plowing, but this is easily removed by one or, at the most, two strokes with an ordinary smoothing harrow which has been turned upside down. It would seem as though the knocking against the bars of the harrow might bruise the roots, or the horses might trample on them, but Mr. Cunningham assured us when this question was brought up that there is no such danger.

The roots are then ready for hauling, and in order to avoid their being cut by the wheels of the waggon a road is cleared with a fork, which is used more or less like a broom with sweeping movements to both sides; this operation does not take nearly as much time as one would imagine. The waggon is loaded from both sides, either by hand or with forks. Mr. Cunningham, though a hard and conscientious worker, does not believe is applying more "elbow-grease" than is absolutely necessary, and prefers to use the fork.

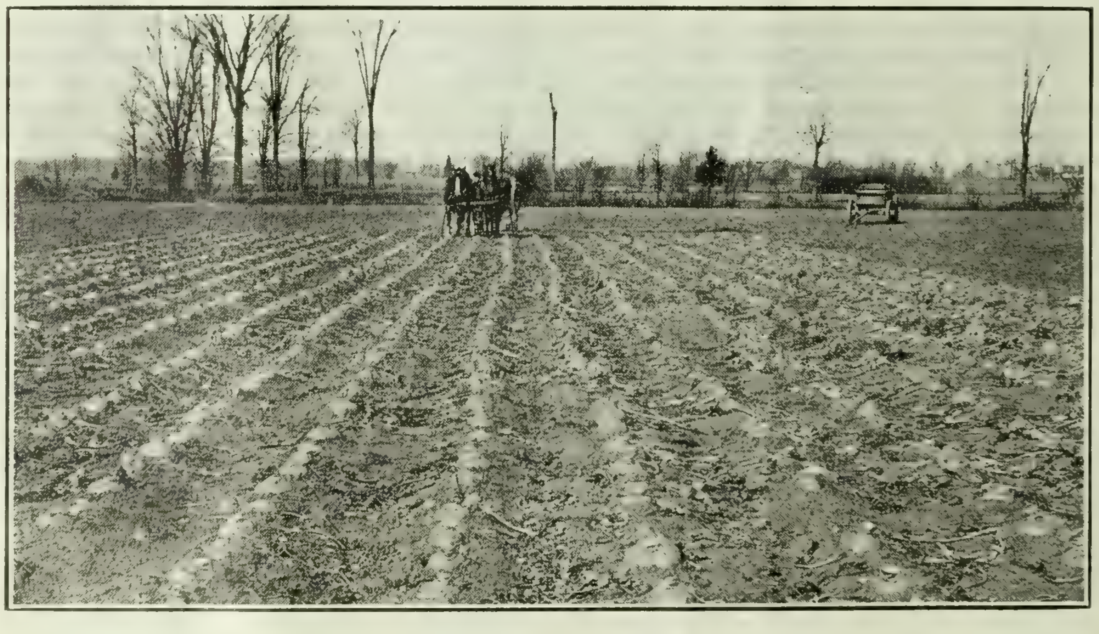


Fig. 1.—Ready to start.

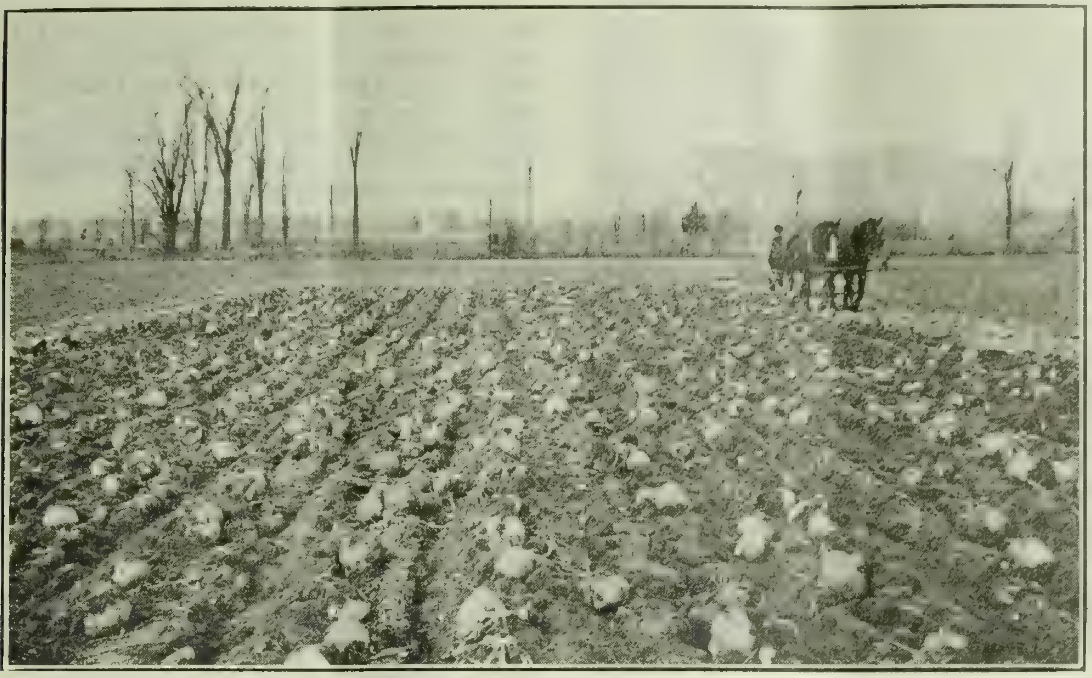


Fig. 2.—Roots plowed out.

Studying and Timing the Method

It was immediately apparent to us that the method just described had many advantages over the old laborious method, even though it might not save so much time as Mr. Cunningham claimed. But the harrowing gave me imaginary "creeps", and I could not conceive but that some of the roots would come out of the fray in the likeness of a badly mauled Rugby player. However, seeing is better than imagining, and it was therefore a great pleasure to me to accept Mr. Cunningham's invitation to go down to Huntingdon and judge for myself as to the merits or demerits of the new scheme. I went down to investigate the method in the fall of 1914, and again last month, when I took several photographs of the different operations.

The accompanying illustrations scarcely need an elaborate explanation. Figure 1 shows the field cleared of tops and ready for plowing. In Figure 2 the result of the plowing is seen. On account of a slight frost during the night the clay loam stuck to the roots in several cases, and it was therefore considered necessary to pass the harrow over twice, when the roots were as free from any adhering soil as one could possibly get them by the ordinary method. In 1914, when the plowing was done on a mild dry day in the first part of November, one stroke with the harrow cleaned the roots perfectly.

An implement that would clean the roots, at the same time leaving them in rows sufficiently wide apart to permit the waggon passing, would be a great improvement. Such an implement might be conveniently built as a wedge-shaped harrow with the teeth comparatively close set and squarely cut at the bottom to prevent their working down in the ground.

The last illustration shows the loading of the roots, with a road cleared for the waggon. A wide loading fork with round knobs on the prongs, enables a man to gather up from two to five roots at one time.

Comparative figures

The Cunningham Method

With ten minutes' haul a man and a boy with a team can clear the leaves from one acre of swedes in 9 hours; say one day.

Depending on the length of the rows the time required for plowing out the roots on one acre varies from 1½ to 2¼ hours.

The harrowing takes 30 to 45 minutes.

With ten minutes' haul a man and a boy can load and unload 750 bushels of roots in a day.

Assuming the yield to be 30 tons (1200 bushels) per acre it would take a man and a boy with a team 28 to 29 hours, say 30 hours, to clear one acre of roots by the Cunningham method.

	HOURS		
	Man	Boy	Team.
Topping and hauling tops. .	10	10	10
Plowing out roots	1½—2¼	1½—2¼	1½ 2¼
Harrowing roots	½—¾	½—¾	½—¾
Hauling 1200 bushels of roots	16	16	16
Total	28 — 29	28 — 29	28 — 29
Round figures. . .	30.	30.	30.

The Old Method

One man can pull and top ¼ acre of swedes in a day. Assuming that a boy of 15 can do ¾ of a man's work it takes the two of them 23 hours to pull and top one acre by hand.

Hauling of tops requires 6 hours,
Hauling of roots requires 16 hours.

	HOURS		
	Man	Boy	Team.
Pulling and topping by hand	23	23	—
Hauling tops	6	6	6
Hauling roots	16	16	16
Total.	45	45	22

By the old method it takes a man and a boy one day and a half more to finish one acre of roots. This means a direct loss of approximately $4.50. The indirect loss cannot be estimated exactly, and it varies of course under different conditions. But where an extra man is not available to work the team, one day and a half may, under adverse circumstances, represent an appreciable difference, for instance, in fall plowing.

After having watched and timed the different operations for two seasons, and having in the meantime observed their influence on the keeping quality of the roots, I do not hesitate to recommend the Cunningham harvesting method to the swede growers of the province. It does away with a great deal of bodily exertion, saves time and consequently money.

P. A. BOVING,

In charge of Root Crop Investigation,
Macdonald College

SHERBROOKE COUNTY PLOUGHING MATCH

THERE was ideal weather on Wednesday the thirteenth of October, when the 36th Annual Ploughing Match was held under the auspices of the Sherbrooke County Ploughmen's Association. The event took place this year on Mr. Jas. O'Connor's farm, Capelton, Que.

In the morning twenty-seven teams lined up on the field, and the work that they did compared favourably with that of former years. One noticeable feature of the event was the increased number of younger ploughmen. Some of the older men were missing this year, but, as might be expected, they are stepping aside to let the younger generation take up the work that they have carried on so well in the past. One of the most pleasing features of the match was the number of young boys behind the walking-plows. The ground was dry in places, and somewhat infested as it was with couch grass, it was rather hard ploughing, especially for the younger plowmen. Mr. W. Lawson, Newport, Vt., and Mr. W. Clarke, Waterville, Que., were the judges, and they seemed well pleased with the class of work that was done.

The Directors, Judges and guests were entertained to luncheon by Mr. and Mrs. O'Connor, and the ploughmen were supplied with a bountiful meal.

The directors are to be congratulated on the success of the match. The President, Mr. O'Connor, the Secretary, Mr. Herbert and Mr. J. Nichol are worthy of much praise for their untiring efforts to make the Match a success. There was a large crowd of visitors present in the afternoon, and much interest was shown in the work of the different competitors.

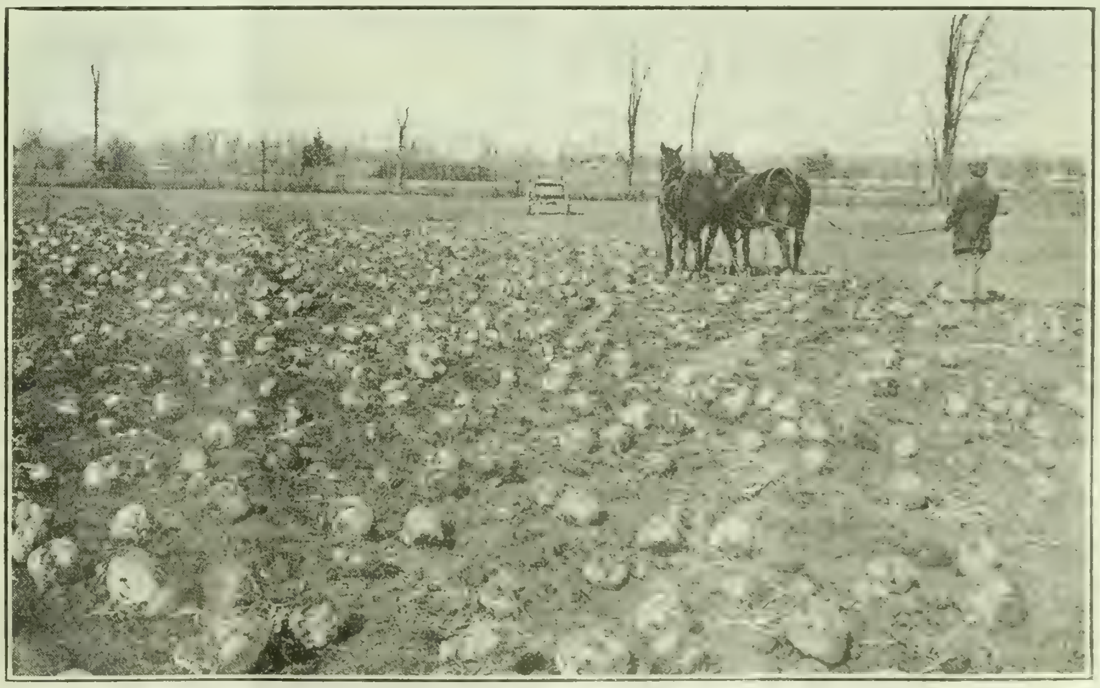


Fig. 3.—Roots cleaned by the harrow after plowing.

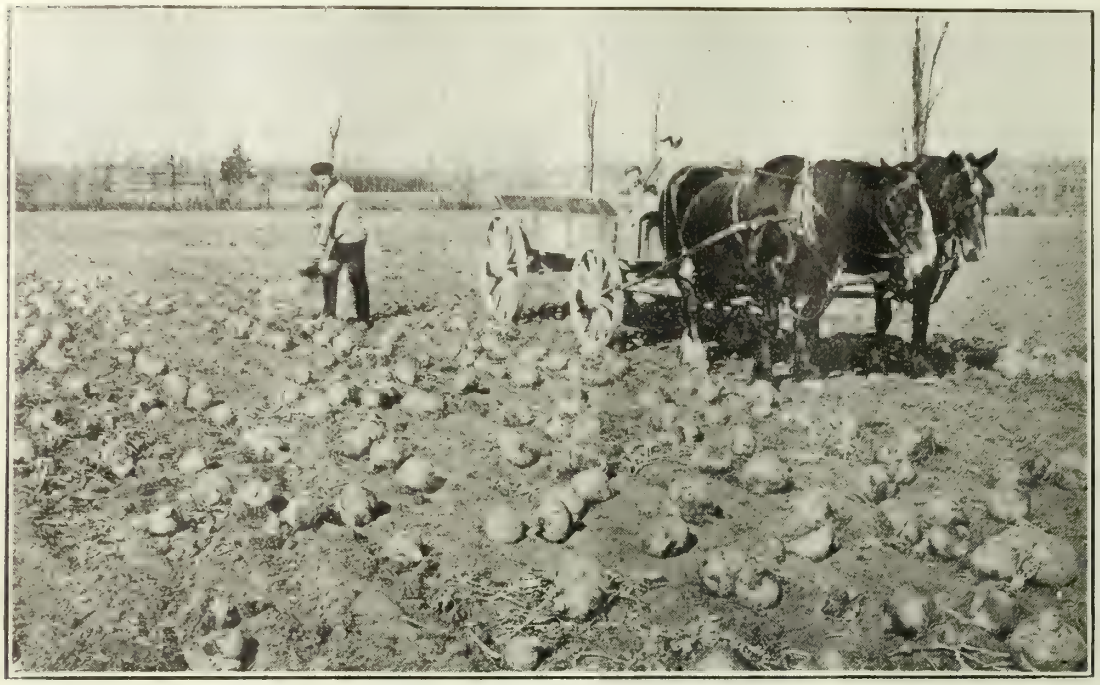


Fig. 4.—Loading the roots with forks.

There were seven classes in all:— Match No. 1. Open to the world, any kind of plow allowed. Won by H. Johnston. Match No. 2. Open to the ploughmen in the limits of the District of St. Francis. Any kind of plow allowed. Won by S. C. Cowan. Match No. 3. For Scotch and imitation Scotch plows. Won by O. Parker. Match No. 4. For skimmer or wheel plows. Won by A Sykes. Match No. 5. Gang or sulky plows. Won by H. W. Loomis. Match No. 6. Sulky plows, open to boys under 18 years of age. Won by Jld. Butler. Match No. 7 Walking plows, open to boys under 18 years of age. Won by C. Young. There were several special classes including Best crown, Best finish, etc. There was $239.00 paid out in prizes, in addition to about $100.00 in collaterals.

The Annual meeting was held in the evening, when the Secretary, D. L. Herbert, read the Annual Report. A vote of thanks was tendered to the President, Mr. J. O'Connor, for the use of his land and for entertaining the directors and the ploughmen during the day. The following officers were appointed for the ensuing year:—President, Mr. J. A. McClary of the Experimental Farm, Lennoxville; Vice-President A. F. Ward; Secretary-Treasurer, D. L. Herbert.

After the Annual meeting the Banquet was held in the Lennoxville House. After an excellent repast was served and enjoyed by all, the President, Mr. O'Connor, took the chair. The first item on the programme was the distribution of prizes by the judges, after which several interesting addresses were heard, as well as several recitations and songs.

Mr. J. Leonard, K.C., of Sherbrooke, described Agriculture as the first among the arts. What would become of the man behind the gun at the present time, without the man who tills the soil and supplies him with the necessaries of life ? Further he advised the young men to stick to the farm.

Mr. J. Fixter, of Ottawa, was the next speaker. He said that he was glad to see so many boys ploughing; but he would suggest to the Association that they should arrange for an Instructor to be on the field to give the boys useful hints on ploughing, and to show them in what respects their work fell short. Further he emphasized the importance of the judges explaining their reasons for their various placings. Mr. Fixter congratulated the Association on their generous prizes, but personally he would prefer to see the boys taking home a medal or a watch instead of money. He congratulated the ploughmen present, on the good work that they had done. It was hoped that the Association will put Mr. Fixter's suggestions into practice in another year.

Mr. F. C. Nunnick, of the Commission of Conservation, Ottawa, was the next speaker. He advocated a Provincial Match where the winners from the local matches might compete, and he endorsed Mr. Fixter's remarks on encouraging the boys in ploughing. He did not believe that the farmer fully realized the splendid position that he occupied in the community, and advocated more matches and social gatherings on the farms to promote neighborliness and to provide opportunity to see what each other was doing.

Several other local gentlemen gave short interesting speeches.

The Scotch songs rendered by Mr. Irving and the comic songs by Mr. Stewart were much appreciated, also the humourous recitations by Messrs Nunnick and Bradley.

The evening was brought to a close by singing the National Anthem.

As a word of encouragement to the boys, the Secretary of the Association wishes to announce that Messrs. Stewart & Clarke, Feed Merchants in Lennoxville, have kindly offered a Cup for the Boys' Match for next year.

The Match was one of the most successful ever held in the County. While the number of teams competing was not as large as is sometimes the case, the interest that was taken in the match shows that the Ploughmen's Association is still a live organization in the County of Sherbrooke, and long may it be so!

W. G. MACDOUGALL

REPORT ON THE STATE OF THE CROPS

In the Province of Quebec, October 1915

Published by order of Hon. J. Ed. Caron, Minister of Agriculture of the Province of Quebec

THE greater part of this season has been marked by a long series of fine sunny days, mingled with occasional local showers, rather limited, however. It is only within the last few weeks that more or less abundant rains have fallen, giving the still standing crops all the necessary humidity. Our principal crop, timothy hay, is below the average this year, reaching only 67 per cent., but is of very fine quality.

Clover has suffered more or less from spring frosts and summer droughts. We advise our farmers who have succeeded in saving some of this valuable seed grain to take great care of it, for it will be rare and scarce next spring.

Pastures, the basis of our dairy industry, have been very poor this summer (63 per cent.) and only improved under the influence of autumn rains, but dairy products have attained high prices, and milk has sold well at the factories. Careful farmers, who have laid in a supply of green fodder to meet the lack of hay, are congratulating themselves on their forethought.

The potato crop also is above the average, the tubers being somewhat small but of fine quality, and prices are firm, the more so that Ontario crop is short and dealers there are seeking our product, while United States potatoes are also a small crop.

As compared with this short yield, we have happily other crops which have not only reached but even greatly surpassed the average. These are cereals, which this year have been most successful, as well as root crops and peas. Wheat growing has again come into favor on many farms, and has given most conspicuous results, viz., 86 per cent.

In several counties of the province it will be necessary next spring to take preventive steps against smut in seed grain, which this year again has done harm in the oat fields.

In districts whose climate specially suits the raising of Indian corn, the Eastern Townships for instance, this great cereal has given magnificent crops. In view of this success the farmers persuaded of the advantages of ensilage, have put up a larger number of silos.

In feed roots, mangolds gave the best yield.

Word comes of damage in many places caused to tender plants, like tomatoes and tobacco, by early fosts occurring towards the end of August.

Caterpillars, which for several years past had established themselves in the central part of the province, doing great damage (to such an extent that many farmers abandoned their farms, ruined by this insect), have now extended their operations towards the west, and their ravages would have become a veritable plague, were it not for the campaign inaugurated by the curés of the devastated parishes, with the aid of the Honorable the Minister of Agriculture. To-day, thanks to the employment of poisoned bran sown on the soil, the evil has been eradicated in several parishes, and the farmers rescued from their foes. Let us hope that this practice will be followed wherever needed.

There has been an increase in the surface of sown land, and a better preparation of the soil.

SEASONABLE HINTS

"THE real test of the farmer is, perhaps, in his ability to make the most profitable use of the various products of his farm and his foresight in getting ready in every way practicable between harvest and seed time for the productive operations of the next season". Thus states Mr. J. H. Grisdale, Director, Dominion Experimental Farms, in presenting Seasonable Hints, No. 3 for November, December, January and February, to the farming public of Canada. A careful perusal of its sixteen pages will amply reward the stockman, the agriculturist, the horticulturist, the poultryman, the tobacco grower and those especially interested in bees. A feature of this third issue is the advice under the caption "Shelter the Implements". The enormity of the vast sum of money spent annually on farm machinery is impossible of realization. To equip an average farm with machinery costs about $1,000, which under ordinary conditions of treatment will not do good work for more than five years. To counteract this waste, for unsheltered implements means waste, shelters should be built. A working plan of a shed 25 by 47 feet outside measurements is given, with directions necessary for its construction. A careful study of this plan, which, as stated, is capable of many modifications, will be helpful to those intending to build. To those, therefore, who would have a compendium of information, which outlines many necessary fall and winter duties pertaining to agriculture in all its phases, Seasonable Hints, No. 3, is available on application to The Publications Branch, Department of Agriculture, Ottawa, Ontario.

FALL TREATMENT OF SOILS

PLOUGHING is always completed as far as possible in the fall for the following reasons:—

1. To lessen the amount of work to be performed in the spring.
2. To expose the soil more thoroughly to the action of frost.
3. To enable the soil to hold as much water as possible in the spring and to facilitate the percolation of excess water.
4. To bury weeds and manure.

Besides ploughing, other beneficial operations are best performed on the soil during the fall, and in particular the curing of sourness. It may be taken for granted that the soil is sour wherever sheep sorrel is present in any quantity, though the absence of sorrel does not necessarily mean that the soil is not sour. A definite proof of sourness is given by litmus paper which may be obtained from the druggist. A piece of the paper is buried in damp soil and well pressed down; after about fifteen minutes the paper should be removed and carefully washed in clean water, making sure that the fingers are also clean. If the paper dries to a red or pinkish colour this is a proof of sourness.

The materials used to cure sourness are lime, which should be slaked, ground limestone, and wood ashes; coal-ashes are useless for this purpose. Ground limestone is a safe remedy on all soils, and may be scattered as evenly as possible at the rate of two tons to the acre. This may be done from a waggon or from a manure spreader the bottom of which has been covered with sacking; a thin layer of ground limestone is then put into the spreader, which is set to run at the lowest speed. On sandy soil ground limestone or wood-ashes only should be used. On other soils, slaked lime may be used at the rate of a ton or a ton and a half, the lighter dressing for water-slaked lime and the heavier for air-slaked lime.

Quick-lime is sometimes put on to the land in small piles to gradually slake into a fine powder, which can then be scattered as evenly as possible. Wood-ashes at the rate of a ton to the acre not only correct sourness but also supply a considerable amount of potash.

The best place to apply these materials is to the land which is to be seeded to clover or alfalfa the following spring.

There is one fertilizer which gives the best results when applied in the fall, and that is basic slag. This may be broadcasted at the rate of 500 lbs. to the acre, and if often beneficial when applied to the clover crop.

When practicable it is a good plan to lightly harrow in these materials in the fall, whereby they are more evenly distributed and buried where they will have more effect.

H. S. HAMMOND

DISTRIBUTION OF SEED GRAIN AND POTATOES

From the Dominion Experimental Farms

1915-1916

BY instructions of the Hon. Minister of Agriculture a free distribution of superior sorts of grain and potatoes will be made during the coming winter and spring to Canadian farmers. The samples will consist of spring wheat (about 5 lbs.), white oats (about 4 lbs.), barley (about 5 lbs.), and field peas (about 5 lbs.) These will be sent out from Ottawa.

A distribution of potatoes (in 3 lbs. samples) will be carried on from several of the Experimental Farms, the Central Farm at Ottawa supplying only the provinces of Ontario and Quebec.

Each application must be separate and must be signed by the applicant. Only one sample of grain and one of potatoes can be sent to each farm. If both samples are asked for in the same letter only one will be sent. Applications on any kind of printed form cannot be accepted.

The destruction by fire of the cereal building at Ottawa, which contained grain-cleaning machinery and a large stock of seed grain for distribution, may make it necessary to curtail the distribution to a certain extent. We shall fill as many as possible of the applications which conform to the rules; but requests received after the end of December will probably be too late. Samples cannot be sent in response to applications (no matter when received) which fail to state clearly the needs of the applicant, his experiences in crop-raising, and the character of the soil on which he intends to sow the seed.

All applications for grain (and applications from the provinces of Ontario and Quebec for potatoes) should be addressed to the Dominion Cerealist, Central Experimental Farm, Ottawa. Such applications require no postage. If otherwise addressed, delay and disappointment may occur.

Applications for potatoes from farmers in any other province should be addressed (postage prepaid) to the Superintendent of the nearest branch Experimental Farm in that province.

J. H. GRISDALE,

Director, Dominion Experimental Farms

CHATEAUGUAY CORN COMPETITION

CHATEAUGUAY county, Quebec, is one of the banner dairy districts of Canada. Silos are almost as common as barns, and corn is the great crop of Chateauguay farmers. This year they had an unusually successful corn competition in the country, and the following are the results:

Alex. Younie & Son, Tullochgorum	91.4
Allan C. Hendersons, Howick	88.3
John Graham, Brysonville	86.0
Albert Ness, Howick	85.4
Neil Sangster, Ormstown	84.6
Robert Holmes, Howick	84.2
R. R. Ness, Howick	83.6
Barnabe Laberge, Ste Martine	83.5
Jas. Cottingham, Ormstown	82.6
Walter Scott, Ormstown	82.3
Wm. Nussey, Howick Station	80.0
James Donaldson, Dewittville	78.1
John W. Logan, Howick	77.0
Joseph Dulude, Ste Martine	76.5
Albert A. Nussey, Howick	76.0
Arthur Mallette, Ste Martine	75.0
Geo. W. Cairns, Ormstown	74.6
James J. McWhinnie, Ormstown	74.5
J. T. Elliot, Howick	68.5

This competition was for corn for ensilage. The judge, Paul A. Boving, of Macdonald College, commented on the results as follows:

"The skill of the Chateauguay farmers in growing corn is clearly demonstrated by the fact that 12 out of 20 fields topped the 80 per cent mark. While this undoubtedly makes the scoring more difficult and compels the judge to spend more time and effort than where competition is less keen, it naturally affords him a great deal of pleasure. Where, as in the majority of cases, the corn had been given proper distance apart, good quality, ranging from fair up to excellent, was obtained from all dent varieties judged, although in my humble opinion, the 'Red Cob' and to a lesser degree the 'Improved Mastodon,' were just a little on the green side.

"Again, 'Quebec Yellow,' entered by one of the competitors, gives too low a yield of fodder, generally speaking, and a corn of this kind is not able to compete successfully with the larger growing varieties. 'Golden Glow,' 'Wisconsin No. 7' and 'Early Leaming' are all well suited for this district.

"Some few farmers still adhere to the old method of close planting, not realizing that by this they lose both in yield and keeping up cultivation. Planting in hills 42 inches each way, with four or five stalks to the hill, or in rows 42 inches apart, with eight to 10 inches between the plants, ensures a gratifying combination of quantity and quality, besides enabling the grower to clean his field properly and to cultivate it well."

Seven prizes were offered, $20, $15, $12, $10, $8, $6, and $4, which go to the seven who scored highest.

NEW GRADES OF SEED GRAIN

SPECIAL grades for seed wheat, oats and barley are now authorized by Order-in-Council as follows:—

No. 1 Manitoba Northern seed wheat shall be composed of 85 per cent Red Fife or of Marquis wheat, sound, clean, free from other grain, and free from noxious weed seeds within the meaning of the Seed Control Act, weighing not less than 60 pounds to the bushel.

No. 1 Canada Western seed oats shall be composed of 95 per cent white oats, sound, free from other grain, and free from noxious weed seeds within the meaning of the Seed Control Act, weighing not less than 36 pounds to the bushel.

No. 3 Extra Canada Western seed barley shall be composed of the six-rowed barley, sound, plump, of fair color, free from other grain, and free from noxious weed seeds within the meaning of the Seed Control Act, weighing not less than 48 pounds to the bushel.

These special grades will be given for the crop of 1915 only on car lots of grain that are inspected into the Government interior terminal elevators at Calgary, Moose Jaw and Saskatoon, and the seed will be made available to farmers and seed merchants at the close of navigation or about December 1st. The advance in prices over commercial grades will be just sufficient to meet the extra dockage required and the cost of cleaning, storing and sacking when the latter is desired by purchasers.

It is not anticipated that the operation of these seed grades will perceptibly alter the quality or value for milling purposes of the commercial grades of grain, as cars of grain for seed will be selected primarily on the basis of freedom from noxious weed seeds.

SEED BRANCH, OTTAWA

SILVER WEED

Editor, Journal of Agriculture.—

A farmer of Chicoutimi informs me that the plant of which I send you a sample is becoming a pest on his land. I shall be glad if you will kindly inform me the best method for its control. The farmers appear to be awakening to the weed and weed seed peril. H. P.

ANSWER: — The weed in question is Silver Weed, or Silvery Cinquefoil, (Potentilla anserina). It is a common weed in most parts of the country and appears on moist land. It is a perennial and has long slender runners which form roots at intervals and produce new plants, in the same manner as the strawberry.

The presence of Silver Weed is an indication that the land is too moist and requires draining:

in fact good drainage is ordinarily all that is required to control this weed, but in places where this is impracticable the plants should be closely cut in June before the first seeds fall or any runners have taken root. Silver Weed is not considered a serious pest by any means inasmuch as it is under the control of the farmer to a large extent if he adopts a simple rotation, drains his land and makes an effort to keep the weeds down by cutting early to prevent their seeding.

We are pleased that the farmers of Quebec are awakening to the weed peril which threatens them. They have been sleeping too long and have allowed all kinds of trashy seeds containing impurities to be sold to them. In our judgment no greater Act was ever put on the Statute Book of Canada than the Seed Control Act, which has as its aim the control of seeds that are being sold to the farmer. Of course it is very difficult to carry this act out perfectly and to prevent impure seeds from getting to the farm, but the farmer can overcome this neglect himself as soon as he becomes awake to the situation and demands pure seed. Of course this costs the seedsman more to prepare, but no doubt he will prepare clean seed if the farmer is prepared to pay the extra price. There is that side of the question to be borne in mind. We have sometimes seen in our trips through the country cases where a farmer had a choice of buying good, medium or poor seed of clover and timothy; he bought the poor sample because it was cheap. It is easy to sow weed seeds, but it is a very difficult matter to get rid of the weeds afterwards. The time will come sooner or later when the farmer will look upon the dearest seed as the cheapest, inasmuch as it is the purest.

W. L.

HOW TO TIDE OVER THE TEMPORARY SHORTAGE OF POTASH FERTILIZERS

THE continued lack of potash may be met in two ways:—

(1) Greater care must be taken of the sources of potash already available on the farm: wood ashes, damaged straw, mangold and other leaves, liquid manure, etc., which are often allowed to waste in normal times. These contain considerable quantities of potash which, in the aggregate, would help materially in coping with the present shortage. Moreover, the ploughing up of leys and grass land leads to the liberation of the potash stored up in the roots, stems, and leaves, causing it to become available for the next crop.

(2) On most well-managed farms there are supplies of potash in the soil which can now be made available. Two agencies may be adopted: (a) sodium salts, especially salt and sodium sulphate, and (b) lime or chalk. The former can be used for mangolds and for cereals when necessary; lime and chalk are more suitable for leguminous crops, clover, etc. There might be some risk in using either for potatoes, and growers would probably do best to put all their supplies of potassium salts on this crop.

Neither lime nor salt actually supplies potash, and the method only works where potash is already stored up in sufficient quantity in the soil. On meadow land poor in potash it may prove better to apply liquid manure, as is often done successfully in the North (of England).

Dr. E. J. Russell in the *Journal*
of the *Board of Agriculture*

HOW TO BUILD CONCRETE TANKS

CAREFUL selection of sand and gravel is the first necessity in the construction of a concrete water tank for the farm. Sand should be clean and sharp, containing not more than three or four per cent of clay. If it contains more clay it should be washed. Gravel should also be clean and not more than three-fourths of an inch in diameter for small tanks or one inch for large tanks. A good mixture for tanks may be made of one part of Portland cement; two parts of clean, coarse sand; and three parts of screened gravel.

The cement, sand, and gravel should be thoroughly mixed dry, by turning with a shovel or hoe. Water should then be added, a little at a time, until the mixture is mushy but not sloppy. If too much water is used and the forms are not tight, a part of the cement will leak out with the water and the concrete will be weakened.

In making a large tank, or one that is going to be moved from place to place, a reinforcing of iron rods or wire mesh is required, though old wagon tires or pieces of strap iron are often used. It is important that the wall reinforcing be made continuous around the corners.

The tank, if a large one, should rest on its own foundation and have a concrete floor surrounding it. This floor will keep the tank more sanitary and also keep the water, spilled by the cattle, from undermining the tank.

The tank may be cast upside down by using a wooden core, and an outside form. The outside form is made straight up and down, while the inside core is made wider at the top than the bottom. Then if the water should freeze in the tank the ice will slide up the sloping sides and be less likely to crack them.

LIVE STOCK

NANCY WAYNE OF RIVERSIDE 3RD.

(See Illustration on Front Page)

NANCY Wayne of Riverside 3rd. is a mature Holstein cow that has proved herself a regular breeder and an unusual producer. Since coming into Macdonald College Stables in December 1912, she has given birth to three healthy calves—Dec. 23rd. 1912, Jan. 22nd. 1914, and April 9th. 1915.

Although coming into her new conditions in very thin shape she produced during that year 14,459 lbs. milk and 497.83 lbs. butter. With an average price of seventeen cents per gallon the value of her milk would be $245.80. Her feed during that year cost $76.95, allowing a profit of $168.85.

Commencing Jan. 22nd. 1914 and until Jan. 22nd. 1915, Nancy Wayne produced 19,159 lbs. of milk and 680.9 lbs. of butter. Her highest monthly production was in March 1914—2,919¾ lbs. milk—and her highest day's work was 106¾ lbs. milk. Her daily ration during March was:—

85 lbs. of silage and roots,
8½ lbs. of hay,
15 lbs. of mixed meal,
2½ lbs. of oil cake, and
1 lb. of molasses.

The total cost of the feed for the month was $11.71 and her milk sold for twenty cents per gallon, making a profit of $46.68. Nancy Wayne's yearly production sold for an average of seventeen cents per gallon, the value of which would be $325.70 and the total cost of her feed during the lactation period was $101.95, which would leave a profit of $223.75.

The third lactation period of this cow, in her present stable, is not yet complete; nevertheless the two years' work presented above is undoubtedly worthy of considerable comment.

A. R. N.

THE RAISING OF HOGS AND THE BACON INDUSTRY

IN order to become better acquainted with the needs of the trade and to obtain information which might benefit farmers interested in stock-breeding, the Hon. Mr. Caron, Minister of Agriculture, makes it his duty, whenever time and circumstances permit, to visit the principal establishments where meats are prepared for market. A visit to the abattoir of the Montreal Abattoir Company enabled him to gather considerable information respecting the packing of beef and mutton.

Lately, on the invitation of Mr. R. N. Watt, the manager of the firm of the William Davis Company, Limited, Montreal, M. Caron, accompanied by Mr. Walsh, ex-member of the Ste Anne's division, visited their immense establishment.

The Davies Company has two abattoirs, one in Toronto and the other in Montreal, where beef, mutton and pork are packed, but where hogs in particular are slaughtered and the meat cured for export. The capacity of their establishments calls for 600,000 hogs per annum. The number of employees is 2000, and the amount of their weekly wages is $25,000. The two abattoirs combined form the largest packing establishment in the British Empire.

Mr. Watt, the manager, who is still quite young but seems fully competent in all the details of the business and manages the immense organization in a masterly manner, said that four or five years ago it was difficult to find an appreciable number of hogs in our province and from 92% to 95% had to be purchased in the West.

Last year, Quebec furnished 15 per cent of the pork exported. This year the Davies Company bought 33% of their output in our province. Not only has the quantity increased, but the quality has proportionately improved, and Mr. Watt attributes this result to the good educational work done by the Provincial Department of Agriculture and the wide distribution of pure-bred boars, as well as to the sales of such animals and the grants given for their purchase and keep.

There is, however, still an improvement to be effected. The hogs are sold too young and their fattening is not sufficiently completed in certain cases. Farmers who sell hogs weighing from 75 to 125 lbs lose from 10 to 20% of the value they might obtain from the same animals if fed until they weighed at least 150 lbs.

A thoroughly well-fed animal usually weighs from 175 to 180 lbs. Its meat is then of the required firmness, and if a little more grain feed than usual is given in the last fortnight, the fatty part is more uniform and has attained the full development required for the meat to be classified as choice meat.

Mr. Watt was, moreover, kind enough to show us statements of his sales on the English market, which show that bacon from properly fattened hogs of the weight last mentioned fetched, throughout the summer, an average of from 10 to 15 shillings per hundred-weight more than that from animals weighing from 80 to 125 lbs. The flesh of the latter is too soft and they are too small for producing first class sides.

It would therefore be to our farmers' advantage to feed and fatten their hogs until they weigh about 175 lbs, for then they would be perfectly fit for slaughter, for when the animal attains the weight of 125 lbs, the greater portion of its bony frame is full grown and then all its food is converted into fat; the cost of fattening is thereby reduced to a minimum for that period, while the animal's value greatly increases both in quality and in price. The hogs are slaughtered in the establishment. This is necessary for the thorough and uniform preparation of the meat which comes on the hoof and is sold by live weight. This is a kind of sale to which our farmers are but little accustomed, but which should be adopted everywhere because it is the fair way.

When the Minister visited the establishment there were several hundred hogs to be slaughtered during the day, and it was noticed that the shape of the animals was excellent as a rule. All that was needed was a slight addition to the weight of a certain number of them.

Mr. Watt estimates that the price of hogs will remain firm for at least three or four years. There is no longer any accumulation of stock on the European markets. For several months the supply has been obtained from day to day, and there is every reason to believe that this will continue for a long while yet, even if peace is restored. Mr. Watt said he could double his sales if he had goods, so pressing is the demand. It will readily be seen that it is in the interest of our farmers to perfect the raising and fattening of their hogs.

Hitherto, the Davies Company has bought chiefly in the Lake St. John district, in the counties of Portneuf, Champlain, Lotbinière, Nicolet, St. Hyacinthe and Richmond. The company will at once send a buyer wherever 75 to 100 live hogs of the required quality can be obtained, and he will pay the highest market prices for them.

According to Mr. Watt, the quality of the mutton of the Province of Quebec is very good. The quantity is increasing and we are exporting it abroad this year.

This visit by the Minister and the information he has obtained will, we hope, stimulate the production of bacon hogs and help to improve the quality. The farming classes will derive a marked benefit from this, and if they are alive to their real interests, they will strive to supply, wholly if possible, the packing establishments in this province. The latter ask nothing better than to secure their raw material at their doors, and are ready to do anything in their power to help to attain that end.

THE TREND OF THE LIVE STOCK SITUATION IN QUEBEC

PERHAPS never before have industries been so carefully surveyed or business so closely analyzed. The slogan "business as usual" applies in only a general way. As a whole, in Canada, we have undergone little or no hardship as a result of the war, but various industries and lines of enterprise have been materially affected. It is obvious to every one that agriculture has been one of the last to be disturbed and within agriculture the live stock industry, ordinarily its most stable branch, has not shown very rapid fluctuation. Nevertheless this is a good time for scrutinizing; it may mean safeguard, and it may mean opportunity.

At present it would seem that the live stock men in Quebec have little cause for anxiety or complaint; the demand for all animal produce is good, the possibilities for production are good, and considerable assistance through various agencies is being given with the hope of bettering conditions and helping the live stock business. Good as the situation may appear a survey of it will reveal a number of regrettable facts.

Partly as a result of the war, but not necessarily because of it, the general market outlet never offered more immediate promise. Not only is it a fact that production possibilities are good but farm practice in the Province of Quebec must in large measure stand or fall by its live stock. The business is being assisted in various ways, and yet live stock men must acknowledge they are working away below their present capacity. The province is undoubtedly capable of carrying more live stock and that Quebec is not limited to low quality is strikingly shown by the achievement in some few districts.

In reference to the various classes it may be said that cattle are making only a fair showing. The number of milch cows has not increased in the past few years, but in spite of this dairying is making progress. The average production of our dairy cows is increasing but it is still well below 4000 lbs. of milk per year, an unprofitable production. Herds are averaging more than twice this quantity and individuals in the province have given five times as much. Surely here is an opportunity. Rejection of the tail-enders, better feeding and care of the others, and a wider use of good purebred bulls would tell a big story in a short time. As for our beef cattle, again we have a few districts marketing creditable stock, but the general average is extremely low. Almost without exception the really good beef marketed in Montreal comes from Toronto. We have few sections suited to beef raising exclusively, but we have a number well adapted for combination practice, and while inferior stock finds a ready market at present the situation demands improvement in Quebec cattle, and here again a better class of bulls is urgently needed.

The horse market at present is on the whole poor. Recently a change from light to heavy horses has been taking place in many parts, and while at present the market is discouraging, it would seem a safe and sound policy to continue breeding heavy ones of the best quality. Really good ones of weight sell even now, and with the re-development of industry and business enterprise will again come into demand. Besides, many believe the horse supply of other countries will be so depleted at the end of the war that a good export trade will prevail.

Sheep in Quebec have been making good progress of late but the limit of the sheep industry is not yet within reasonable distance. Quebec carried more sheep forty years ago than she does to-day. In certain districts the quality is good, but generally speaking, Quebec lambs need improvement. This is being accomplished at a fairly rapid rate. In the minds of many the greatest impediment to the sheep industry in Quebec is the risk with dogs, against which more adequate and effective protection than is now afforded seems urgently needed.

In swine Quebec occupies a position of interest. A few years ago the great difficulty with Quebec hogs was over-weight and too much fat. The production of such hogs was an expensive undertaking, as the market for them was local and limited. The packers were unable to handle them for export trade, and as soon as the local market was supplied there was little or no demand for them and they depressed the market for hogs suitable for export trade. Finally, after considerable urging and teaching that such practice in hog raising was entirely wrong for Quebec, the pendulum seems to have swung the other way and now a great many Quebec hogs fall short of market requirements because of being too light and too unfinished in condition. Montreal is one of the best hog markets in America, but the biggest part of the packers' supply comes from Ontario and farther West. The number of hogs produced in Quebec is increasing and the quality of them, due to the introduction of many good breeding pigs, has been materially improved, but the packers cannot accept Quebec hogs unless they are of the proper weight and finish, hogs weighing about 175 to 225 lbs. when about seven months old. At times the local market is all right and pays a good price for dressed pork, but the type of hog necessary for the packer is also well suited to this trade. If the hog is to be given his proper chance of making money in this province the farmers must learn to appreciate the requirements of the bigger outlet and sell hogs on foot rather than rely solely on dressed hog trade, thereby restricting themselves to only one and certainly not the best market.

H. BARTON

SIXTH ANNUAL SALE OF THE STOCK-BREEDERS' SOCIETY

THE General Society of Stock-Breeders of the province of Quebec held their sixth annual sale of pure-bred stock on October 13th in Montreal and on October 20th in Quebec. About 200 people were present at Montreal and about 250 at Quebec.

The Society had 390 animals on sale, comprising 109 cattle (Canadians, Ayrshires and Holsteins); 144 sheep and 137 swine.

The following is the number of each sold at the two places:—

Cattle,	*Montreal.*	*Quebec.*	*Total.*
Canadian,	12	21	33
Ayrshires,	38	23	61
Holsteins,	11	4	15
	61	48	109
Sheep,			
Leicesters,	22	40	62
Cotswolds,	11	4	15
Lincolns,	8	4	12
Hampshires,	11	9	20
Oxfords,	17	4	21
Shropshires,	9	5	14
	78	66	144
Swine,			
Yorkshires,	17	33	50
Chesters,	12	47	59
Tamworths,	7	10	17
Hampshires,	0	2	2
Berkshires,	3	6	9
	39	98	137

The above figures included 75 males and 34 females, cattle; 70 males and 74 females, sheep; 91 males and 46 females, swine.

The animals were sold at lower prices than in previous years. At Montreal the Canadian and Ayrshire cattle sold for good prices, but the Holsteins did not fetch enough to cover the cost of buying. Sheep and swine were about $100 below the purchase price.

At Quebec the cattle sold at a good profit. The price for sheep just covered the purchase price, but the sale of swine was disastrous. It would have been the same at Montreal if we had put on sale the 50 head which were intended for that market. As it is, we lost $500 on swine.

The profits realized on cattle, at both Montreal and Quebec, but chiefly at Quebec, about covered a third of the expenses, and the deficit will not be much greater than it was last year.

Needless to say, the Quebec Department of Agriculture bears this deficit. Farmers should be grateful also to the Hon. J. Edward Caron for putting the Society in a position to hold these sales, which year by year increase in size and importance, and render great service to the agricultural population. That they are very successful will be seen by the following table:—

Year.	*Animals on sale.*	*Deficit.*	*Cost of operation.*
1910	187	$2080.52	$6570.52
1911	288	$1973.23	8247.23
1912	312	3338.96	11892.01
1913	317	2644.28	13226.91
1914	348	3395.66	15550.06
1915	390	3400.00*	18000.00*

*We are unable at the moment to give the exact cost of operation and the amount of deficit; the figures given are only approximate.

Does the farmer realize the advantage of these sales? We doubt it. To begin with, there is the opportunity offered to him to obtain without trouble, without great expense and without loss of time the animals he is in need of to improve his herds. He comes to the sale, sees the animals, chooses those he wants and buys them. He has the opportunity of comparing the various animals, and also, as this year, of buying what he wants at half their value, so far as sheep and swine are concerned.

But it not only gives the farmer an opportunity of buying pure bred stock, it helps him to dispose of them also. The Society's sales have created an excellent market for our stock-breeders.

Consider it,—the Stock-breeders' Society has bought this year 390 animals, of which 371 in the province of Quebec are bred by 82 breeders in all parts of the province. How many of these 82 breeders would have been able to dispose of their stock if the Society had not bought it? These sales are also an excellent means of advertising the various herds. How many of these 82 farmers would ever have been known to the public as breeders of pure bred animals, if their names had not figured in the sale catalogue published by the Society?

The Stock-Breeders' Society has rendered a great service to the agricultural population in inaugurating these sales, and the Hon. Mr. Caron has rendered an equally great service in enabling the Society to do so. We hope that the agricultural community will duly appreciate this.

J. A. COUTURE,

Secretary of the Stock-breeders' Society

HEALTH OF ANIMALS

THE recently issued report of the Veterinary Director General (F. Torrance, B.A., D.V.S.) is a comprehensive document and one worthy of extensive public reading. There is no branch of agriculture of more universal importance than the health of food-producing and utility animals. Dr. Torrance goes fully into the activities of his branch. "In some directions", he says, "such as the control of glanders and of mange, much progress has been made; the country has been protected against invasion by diseases foreign to it; additional facts have been brought to light by the members of the branch engaged in scientific research, and there has been a marked advance in the division entrusted with the inspection of meat and canned foods." On the other hand, the Veterinary Director General continues, "I have to report a serious outbreak of dourine in the Province of Alberta and continued losses from hog cholera."

Regarding glanders it was found necessary to slaughter only 363 horses in 1914 as compared with 638 in 1913. In combating hog cholera 9,900 hogs were slaughtered in 1914 at a cost of $61,588.14 in compensation. The figures in the latter instance present a formidable aspect, but, as Dr. Torrance remarks, "As the hog population of Canada is approximately 8,000,000 the loss of even 10,000 is not high." He adds that the disease rarely breaks out a second time on premises where it has been extirpated, that the feeding of uncooked garbage to hogs continues to be in many cases the cause of the initial outbreak, and that the neglect of owners to notify the department of the appearance of the disease is chiefly responsible for its spread. The last remark applies to the initiatory manifestation of all other infectious or contagious diseases. The war against tuberculosis continues with unremitting vigour.

The research and experiments carried on at the different official laboratories are described, and statistical tables given of results, and of the inspection of animals imported and exported and of packing establishments and abattoirs. Import inspections from the United States and Newfoundland in the year ending March 31st, 1914, totalled 29,726 horses, 1,641 mules, 14,747 cattle, 213,332 sheep, 374 swine, 822 goats, 22 asses, 8 elk and 5 elephants.

Some two dozen contributions from the chiefs of divisions stationed at different points—inspectors, pathologists, biological experts and superintendents of quarantine stations—with a number of illustrations of animals variously infected, combine to make a most useful and widely interesting report, which can be had free on application to the Publications Branch, Department of Agriculture, Ottawa.

SALE OF PURE BRED SHEEP AT SHERBROOKE

THE Auction Sale of Pure Bred Sheep, held under the auspices of the Sherbrooke, Compton and Stanstead Wool Growers' and Sheep Breeders' Associations, was held on the Exhibition Grounds, Sherbrooke, on Saturday October 16th, 1915.

About thirty-five registered sheep of different ages were offered for sale and of these twenty-seven were sold. Mr. A. A. MacMillan, B.S.A., of Macdonald College had selected these sheep from the flocks of the best breeders in the Province, and they were the best of the different breeds that could be had in the Province. A few individuals, however, due to lack of condition, did not show up to advantage, consequently did not bring as high prices as the better conditioned animals. The prices on the whole were good, ranging from $11.00 to $26.00. The highest price paid was for a Hampshire ewe owned by A. J. Lyster, Kirkdale, Que.

The following breeders contributed to the sale:—Mr. H. Murray, Magog, Shropshires; Wm. C. Strong, West Brome, Leicesters; W. J. Bishop, Magog, Shropshires; E. A. Camber, Smith's Mills, Oxfords; H. G. Curtis, Smith's Mills, Oxfords; A. Watters, Richmond, Shropshires; George Hodge, Cookshire, Leicesters; H. G. Silver, Danville, Leicesters; Snaden Bros., Danville, Leicesters; A. J. Lyster, Kirkdale, Hampshires; R. H. Libby, Ayers' Cliff, Hampshires; F. N. Prefontaine, South Durham, Shropshires; J. H. Pibus, Knowlton, Leicesters; A. G. Spafford, Compton, Shropshires; H. H. Fuller, Capleton, Shropshires; Byron Brown, Smith's Mills, Shropshires.

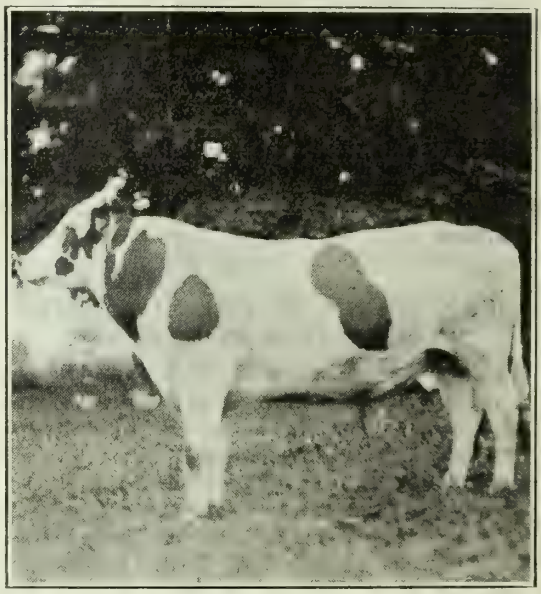
Mr. J. J. Griffith, who was the Auctioneer, handled the sale in a very satisfactory manner to all concerned, and as usual kept the crowd in good humour. It is the intention of the Directors of the Wool Growers' and Sheep Breeders' Association to make the sale an annual event, as it affords the breeders a splendid opportunity to select and interchange breeding stock. It might be well to mention here, that in future it would be advisable for all those who intend to offer stock for sale through the Association to have their stock in good condition. It is hoped that the farmers and breeders will give the Association their support in the work they are doing.

W. G. MACDOUGALL

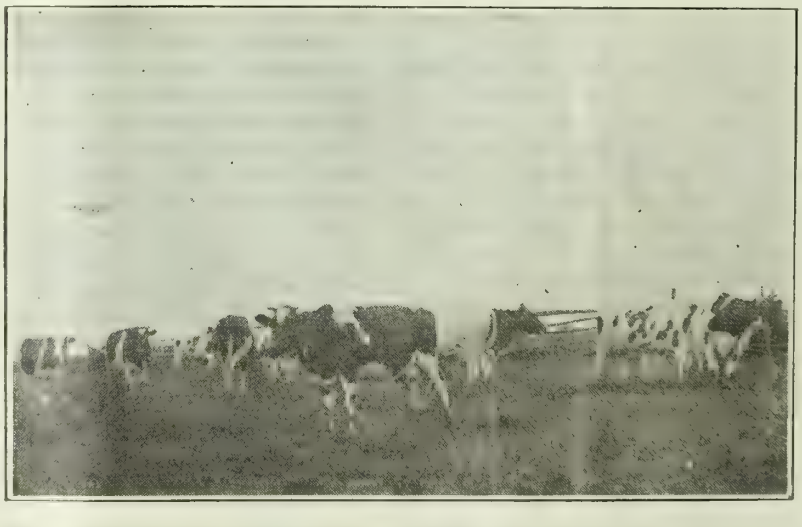
SOME FLOCKS, HERDS AND FARMS OF THE BEDFORD DISTRICT

VI—The Woodbine Herd of Holstein-Friesian Cattle

MR. Walter Bromby, who has a 160 acre farm at East Farnham, has been in the Holstein business for twelve years and has now a herd of 35 pure breds. His bull, King Seegis Ruby Walker, is a grandson of the famous King Seegis. Among his cows are the ten-year old Hazel Mercedis de Kol, producer of 20 lbs. butter as a three year old and of 17800 lbs. milk with 4 per cent. of fat at the age of eight; a daughter of the preceding which gives milk testing 4.3 per cent. and the twelve year old Utica Belle, which made a record of 14 lbs. butter in a week as a three year old and has done better since, having made 24 lbs. in 7 days private test. Mr. Bromby feeds oats, hay, ensilage and sugar beets. He has experimented with alfalfa but has found difficulty in growing it on his farm. He is also in the poultry business on a larger scale than most farmers, his flock numbering some three hundred pure bred Columbian Wyandottes.



King Seegis Ruby Walker. Head of the herd of Mr. Walter Bromby, East Farnham.



Holstein Herd of Mr. Walter Bromby, Woodbine Farm, East Farnham.

Grade Ayrshire Herd of Mr. Geo. Beach, Cowansville.

VII—A Diversifield Farm

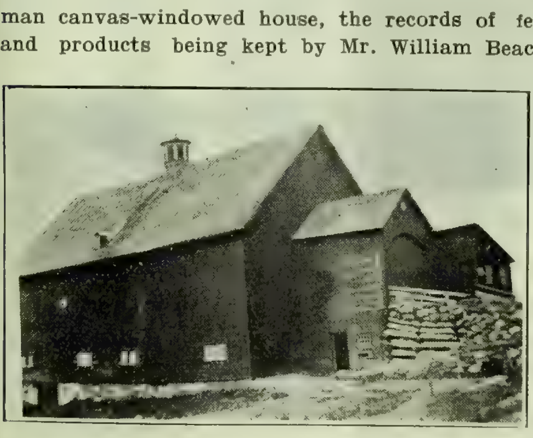
A typical general farm with many commendable features is that of Mr. Geo. Beach of Cowansvills. This farm comprises in all about 320 acres of which, however, only 80 to 100 acres are under cultivation. A five year rotation is followed. A good summer and winter dairying business is conducted with a herd of some 55 grade Ayrshires. Cream is the market product. It is shipped to Montreal.

Demonstration Poultry House on the farm of Mr. Geo. Beach, Cowansville.

From 15 to 25 pigs are fed. A small flock of sheep is kept, comprising about 20 grade Shropshires. There are ten horses, including a pure bred Clydesdale mare.

Mr. Beach has two silos and practices summer feeding to some extent. About four acres of excellent red clover were grown for seed last season. A considerable amount of maple sugar is also produced.

The fact that the farm is the seat of one of the Macdonald College poultry demonstrations and that purebred ducks, geese and fowls are kept gives it prominence in the poultry world. The poultry demonstration is conducted with the Tolman canvas-windowed house, the records of feed and products being kept by Mr. William Beach. The fowls used in this demonstration are Barred Plymouth Rocks, of which about 125 are kept.



Farm Barn on Mr. George Beach's Farm, near Cowansville.

It is clear, then, that the farm is one conducted on the diversified principle and that Mr. Beach has many strings to his bow. Mrs. Beach is well-known as an active worker in the organization of Homemakers' Clubs.

J. F. S.

GREAT AYRSHIRE FIELD DAY

ONE of the most interesting and profitable Field days for Ayrshire breeders that I have seen was that held at "Strathglass Farm", Port Chester, N. Y. on October 23rd. The proprietor, Hugh J. Chisholm, had arranged a programme, complete in every detail, that was thoroughly enjoyed by the breeders of Ayrshires, as well as the lovers of some of the other breeds of dairy cattle.

Owing to the curtailment of live stock exhibits at State and National Shows, Mr. Chisholm conceived this scheme in lieu of exhibiting, which was so successfully carried out and was certainly a good advertisement for "Strathglass" Ayrshires and the breed as a whole. Over 300 visitors, many from long distances, were present during the day and witnessed the demonstrations and judging of the classes. Among those present were the following noted Ayrshire breeders:—

Dr. J. A. Ness, Auburn, Maine, President American Association; Jos. Saladino, Oxford, N. H.; W. P. Schank, Avon, N.Y.; Patrick Ryan, Brewester, N.Y.; John Cochrane, Bryn Mawr, Pa.; J.W. Pardy, Sarangassett, Mass.; W. J. Speikerman, Greenwich, Conn. Canada was represented by R. R. Ness, A. J. Ness, Hector Gordon, James McKell, W. F. Stephen, Secretary of the Canadian Ayrshire Breeders' Association, G. W. Muir, and Gilbert McMillan. There were also present a large number of prominent Guernsey and Jersey breeders, who seemed to follow the proceedings with as keen interest as the Ayrshire followers.

Many ladies were also present who seemed to enter with zest into the spirit of the day.

At noon a sumptuous luncheon was served by the host, and automobiles were at the service of the guests during the day.

Invitations were extended to Agricultural Colleges to enter teams in the judging competition and six colleges sent trios to compete for the splendid trophy,—a large silver cup,— offered by Mr. Chisholm. He also gave a smaller cup to the individual making the highest score.

The demonstration and judging was conducted by Prof. H. Barton of Macdonald College, Que., who is recognized as one of the most capable live stock men engaged in college work. He was assisted by Prof. Garrigus of Storrs, Conn.

The Ayrshires which were passed upon were the best that could be had in Scotland, Canada and the United States, and embraced such males as "Hobsland Perfect Piece", "Netherhall Wide Awake", "Netherhall True to Time", "Strathglass College Night", and among the females were noticed "Beuchan Ermine", "Beuchan Lady Constance", "Shewalton Mains Queen", "Fairfield Mains Jean", "Lochfergus Snow", "Burnside Stonechat" and "Burnside Lady Fanny" all of which stood high in their respective classes. They were in fine form and there were many interesting and closely matched classes, where decisions had to be made on fine points and where the professor admitted there was room for a difference of opinion. Sometimes the ringsiders did not agree with the decisions of the Professor, but he always defended his placings with good logical reasons. Space will not permit mentioning the animals or the classes, further than to say that there were three male and four female classes, junior and senior, get of sire, and herds. Then, too, there were classes of Clydesdales and farm teams, which the students were asked to pass on and which were counted in the total score. When the gets of sire and aged herds came out it was a wonderful display, a tribute to the judgment and pluck of the owner and to the skill and care of those directly in charge of them.

The day's proceedings closed about 4.30 p.m. and all were of the opinion that it was a great day for the Ayrshire men. By 10.45 Profs. Barton and Garrigus, assisted by A.R. Ness, B.S.A., had the results tabulated, and were able to announced the awards as follows:— First, Pennsylvania, 1046 points; Second, Connecticut 1024½ points; Third, Cornell, 1024 points; Fourth, Rhode Island, 985 points; Fifth, New Hampshire, 928 points; Sixth, Massachusetts, 810½ points. The highest individual score was made by Dunham of Cornell, with 399 points. In the cattle Connecticut led, but the Quakers more than made up their score when it came to the horses. Commenting on the work of the boys, Prof. Barton expressed himself as being well satisfied, the majority in every class getting the placings correctly. But for the fact that nearly every team had a straggler the scores would have been much higher. Did space permit much might be written on the buildings at "Strathglass". Great as is the herd, the equipment is in keeping with it and presents many new features in dairy architecture.

W. F. S.

"Its the thousand winks of childhood that widen into one clear dream of age".—*Blackmore.*

A QUICK DIAGNOSIS.—A youthful physician had been summoned as a witness in a case which depended on technical evidence, and opposing counsel in cross-examination asked several sarcastic questions about the knowledge and skill of so young a doctor.

"Are you", he asked, "entirely familiar with the symptoms of concussion of the brain"?

"Yes".

"Then I should like to ask your opinion of a hypothetical case. Were my learned friend, Mr. Banks, and myself to bang our heads together, should we get concussion of the brain"?

"Mr. Banks might".—Pittsburg Chronicle Telegraph.

Watermelon sirup is the latest wrinkle. The juice is squeezed from the pink flesh of sweet, fully ripe melons, and then boiled down in an ordinary preserving kettle. When the juice begins to thicken, a slower fire must be used in order to prevent burning. It requires about 13 gallons of juice to make one gallon of sirup, the juice being cooked until a small sample on cooling is about as thick as maple sirup. Other fruits make good sirups, and recipes for making may be secured by writing the U. S. Department of Agriculture, Washington, D. C.

THE DAIRY

IS THE MILKING MACHINE EFFICIENT ?

DURING the last year several trials of modern milking machines have been completed, and it is very instructive to study the records and compare the observations of the investigators. As a rule very little fault is found with the mechanical part of the machines. They are easy to handle, the manual labor is reduced considerably and the cows themselves do not object seriously to the innovation. Further, the amount of strippings remained as before, and there was no decrease in milk production.

However, when we consider the purity of the machine drawn milk we find much dissatisfaction. Theoretically the machines should produce milk containing less dust and fewer bacteria than other milk. A simple comparison of the usual sources of contamination will make that point evident.

Machine-drawn milk.	*Hand-drawn milk.*
———	Bacteria from stable air.
———	Bacteria from coat of animal
———	Dust and hairs.
———	Bacteria from the milker.
Bacteria on utensils.	Bacteria on utensils.

The numbers of bacteria derived from these sources are considerable, although they will decrease as more care is given.

Realizing this big handicap against hand milking, why are the practical results against machine milking? Except in cases where the machines have been run by College experts the sanitary balance was in favor of hand milking. For a long time the blame was given to the faulty methods of cleaning the machines, and usually such happened to be the case. But even when the machines are given perfect care and everything is perfectly sterile the same phenomenon has been observed. The trouble seems to be in another direction, and is probably due to the teat cup. A strong vacuum is maintained in the machine to enable the flow of milk from the teats. As soon as the teat cup is disconnected this suction draws the stable air in the milk reservoir.

Some milking machines have taps at the base of the teat cups whilst with other types the rubber tube must be bent double to prevent the passage of air. In all machines large quantities of air will enter if the cup slips from the teat during the process of milking, for the weight of the teat cup is not sufficient to bend the rubber so far that the passage is closed.

The entrance of this stable air always adds numerous bacteria to the milk. In a pail exposed for 10 minutes there were 2000 bacteria, but one gallon of that same stable air contained 7000 bacteria.

Bacteria are so minute that they will float in the air for a considerable time and only a small proportion will settle down in a period of 10 minutes.

J. VANDERLECK

COW TESTING NOTES

WHAT IS COW TESTING ?

COW testing, as carried on by the Dairy and Cold Storage Commissioner's Branch, is a simple method for finding the number of pounds of milk and butter-fat each cow produces during a milking period. It consists of weighing the milk and taking a sample for testing night and morning on three days each month, preferably at intervals of ten days, as on the 1st, 11th, and 21st. The total of the weights on these three days, multiplied by ten, gives the pounds of milk produced in thirty days, and the pounds of milk multiplied by the test gives the pounds of fat.

EQUIPMENT NECESSARY

Each farmer must provide himself with a suitable scale, a small dipper, a sample bottle for each cow in the herd, and a box for holding the sample bottles. The cost will be about as follows: 40-pound spring scale, $1.25; dipper, 10 cents; bottles, 5 to 6 cents each; and a box for the bottles from $1.00 to $1.25, according to number of bottles required. The entire outfit can be purchased from any dairy supply house. Spring scales can be purchased from the firms whose names are published herein.

WEIGHING AND TAKING THE SAMPLES

Each cow should be given a number, and a corresponding number should be put on each sample bottle. Hang the scales as conveniently as possible to the milking place, with the record sheet close by. It is a good plan to have a special pail to empty each cow's milk into for weighing, and immediately after pouring the milk into this pail, take a sample with the small dipper and put it in the sample bottle. It is very important to have the milk thoroughly mixed before taking the sample. If the milk is allowed to stand for even three or four minutes before taking the sample, the cream will begin to rise and the sample will not give an accurate test of the butter-fat in the milk. After sampling, weigh the milk and write the weight on the record sheet. One preservative tablet (or two in excessively hot weather) should be put in each bottle with the first sample of milk. If everything is convenient, it need not take more than one minute per cow to do the weighing and sampling. The samples, with the record sheets, should be delivered to the testing point immediately after the sixth sample is taken on the third date for weighing.

TESTING FOR BUTTER-FAT

In a number of districts the Department has organized Dairy Record Centres, with men in charge who spend all their time encouraging the dairymen to improve their herds by keeping records of individual cows. They test the milk samples at certain points, usually in cheese factories and creameries, and forward the records to Ottawa. In many other places, arrangements are made with the cheese and buttermakers, or some qualified person, to do testing. The Department makes special arrangements for assisting those who do the testing, particulars of which may be secured by writing to the Dairy Commissioner, Ottawa. The persons who do the testing enter the butter-fat tests on the milk sheets and mail them to the Dairy Commissioner, Ottawa, where the figures are extended and a record of the milk and fat for each cow returned to the dairyman every month. In the month of July, 1915, records were received in the office at Ottawa of 22,669 cows.

WHY SHOULD DAIRYMEN KEEP MILK RECORDS ?

The basis of building up a dairy herd is to know what each cow is producing through the milking period. No one can tell how much milk and fat a cow produces unless the milk is weighed and tested. If the owner does not know how much milk and fat each cow produces, how can he tell which are the best cows to raise heifer calves from?

Cow testing not only produces better cows, but more interested and better dairymen.

Weighing, sampling, and marking down the weights of each cow's milk at regular intervals is good sound business and keeps tab on the milkers as well as on the cows.

The best results are secured when record-keeping is made a permanent practice and continued from month to month and from year to year.

A spring scale, a sampling dipper and a sample bottle for each cow in the herd is the equipment every dairyman should have. The use of these and a Babcock tester will discover the good and poor cows in the herd.

With each cow's record before him, the dairyman is able to feed more intelligently. "Meal in proportion to milk" is a good motto.

WHAT SOME DAIRYMEN HAVE ACCOMPLISHED BY COW TESTING

The figures of a creamery statement at Way's Mills, Que., show that from a herd of twelve cows in 1912, the cash received by the owner was $297.85. In 1914, from twelve cows he received $804.48. He discovered the poor cows and got rid of them.

At Mallorytown, Ont., a herd of twelve cows has increased from 3,726 pounds of milk per cow in 1909 to 7,388 pounds per cow in 1914; this is an increase of 3,662 pounds of milk per cow, or 98 per cent.

In Hastings county, Ontario, a farmer commenced cow testing in 1912 and found his herd of ten cows averaged 5,780 pounds of milk and 187 pounds of fat. In 1914 his ten cows averaged 7,436 pounds of milk and 254 pounds of fat, an increase of 1,656 pounds of milk and 67 pounds of fat in two years.

At a Nova Scotia creamery there are thirty patrons who took up cow testing five years ago. They were then receiving only about $30 per cow. Last year their cows averaged almost $60 each.

A Quebec creamery patron in 1912 received $400 from fifteen cows. In 1914 he received $800 from eleven cows. It paid him well to weed out the poor cows.

It certainly pays to know what each cow is doing. Keeping individual records will tell this. Get rid of the poor cows, carefully feed the good ones, and breed them to a pure-bred sire from large-producing ancestry, the result will certainly be a large-producing and profitable dairy herd.

The following firms are authorized to sell spring scales for cow testing work: G. A. Gillespie, Peterboro, Ont.; W. A. Drummond & Co., 214 King St. East, Toronto, Ont.; C. Richardson & Co., St. Mary's, Ont., Calgary, Alta., Winnipeg, Man., and Vancouver, B.C.; Morgan's Supply House, London, Ont.; C. H. Slawson & Co., Ingersoll, Ont.; Ballantyne Dairy Supply Co., Stratford, Ont.; D. H. Burrell & Co., Brokville, Ont.; D. Derbyshire & Co., Brockville, Ont.; Lawrence Dairy Supply Co. Ltd., 87 Besserer Street, Ottawa, Ont.; De Laval Dairy Supply Co. Ltd., Peterboro, Ont., 21-23 St. Peter Street, Montreal, Que., Winnipeg, Man., and Vancouver, B.C.; Ellis & Grogan, Calgary, Alta.; W. H. Gunn & Co., Vancouver, B.C.; Dillon & Spillett, Charlottetown, P.E.I.

Blank forms for recording both milk and feed, and full information regarding the work of cow testing may be obtained from the Dairy Commissioner, Ottawa.

POULTRY

FREE COURSE TO POULTRY RAISERS

A Short Course of Instruction and practice in poultry keeping will be given at Macdonald College, Ste. Anne de Bellevue, from February 14th. to March 3rd. 1916.

The programme will provide hours for regular practice, demonstration and observation, in which the plant of the Poultry Department will be used.

Students are expected to do practical work in feeding and watering fowls, also operating incubators from 8.00 to 9.00 a. m., 1.00 to 2.00 p. m. and from 4.00 to 5.00 p. m. Lectures are given daily from 9.00 a. m. to 12 noon and from 2.00 to 4.00 p. m.

This Short Course is intended to assist in supplying the demand for practical knowledge in the raising of poultry. It is of considerable value to all those who are now keeping fowls as well as to those who intend to start in the poultry business. Lectures will be given every day and hours will also be provided for work in feeding poultry and in incubation and brooding.

Some of the phases of the poultry business discussed will include:— Profits in Poultry Keeping; Laying Out a Poultry Plant; Poultry Keeping on a Town Lot; The Intensive and Extensive Methods of Poultry Culture; Poultry House Construction; The Breeding and Judging of Utility Poultry; Incubation and Brooding; Methods of Feeding Poultry; Markets, and Marketing Poultry Produce.

The Professor of Biology will give lectures on Poultry Zoology including:—The Anatomy of the Fowl; The Embryology of the Chicks; and the Parasites of Poultry.

The Professor of Cereal Husbandry will give a number of lectures on Crop Production and Soil Management as related to poultry raising.

The Professor of Horticulture will give a course of lectures on The Growing of Small Fruits; the Care and The Management of the Orchard, and other horticultural subjects of interest to poultrymen.

The College Veterinarian will give lectures with demonstrations on the Hygienic Requirements of Poultry; Cleanliness, and various poultry diseases.

The Demonstrator to Homemaker Clubs will give lectures and demonstrations on Trussing Birds for the Table, Roasting and Serving Poultry, and the Value of Poultry and Eggs in the Diet. This course will be of special interest to all housekeepers.

The following lecturers will take part: Mr. M. A. Jull, B. S. A., Manager & Lecturer; Mr. S. A. Bergey, B. S. A., Assistant, Mr. A. G. Taylor, B. S. A., in Charge of Extension Work; the Demonstrator to Homemaker Clubs; the Professors of Bacteriology, Biology, Cereal Husbandry, and Horticulture; Mr. W. A. Brown, B. S. A., M. S., Chief of the Poultry Division, Live Stock Branch, Dominion Department of Agriculture, Ottawa, Ont.; and Mr. George Robertson, Assistant to the Dominion Poultry Husbandman, Central Experimental Farm, Ottawa, Ont.

The Poultry Plant at the College gives excellent opportunity for the study of the practical side of the industry. The course will be full of up-to-date information designed for practical poultry keepers and it should enable all interested to become more familiar with the principles of successful poultry keeping.

For the Short Course Announcement and other information those who wish to attend should write The Principal, Macdonald College, Que.

DRESSED POULTRY STANDARDS

FOR the past two years considerable interest has been taken in efforts to improve the markets in dressed poultry. Many people realize that a large quantity of dressed poultry is annually marketed in a very unsatisfactory condition. Many farmers and poultry producers do not know how to kill and pluck poultry properly, and it must be admitted that many others have little or no scruples in marketing poultry which is unfit to eat. Thousands of birds are offered on the markets with food in the crops and with the intestines full of partly digested material. Many birds are scalded instead of being dry plucked, with the result that they do not keep at all well. In some sections throughout the country, a very bad practice prevails of drawing dressed poultry for market. Poultry producers have much to learn before the bulk of the poultry offered on the markets will be prepared in proper form.

Another important feature affecting the prices of dressed poultry is the time of marketing. Un-

A white Cornish hen of good type in the breeding pen at Macdonald College. The Cornish is noted for its fleshing qualities.

der present conditions, the bulk of the surplus stock for the farms and poultry plants is sold in the fall of the year. It is true that a few broilers are disposed of in the summer and fall, but the great bulk of the surplus chickens which are sold as roasters are sold between October and the first of January. This applies to dressed ducks, geese and turkeys as well. It is quite apparent that improved conditions will result if poultry is marketed over a wider period. It is along this line that the efforts of the Poultry Division of the Live Stock Branch at Ottawa have been exerted for the past two years. The Poultry Division under the directions of Mr. W. A. Brown, is endeavoring to encourage farmers and poultry producers to sell their stock over a longer period and thus avoid a glut on the market in the fall and early winter. The buying houses are also being encouraged to lengthen the period of marketing dressed poultry and it is hoped that good results will follow. A letter has recently been sent out by Mr. John Bright, Live Stock Commissioner, relative to the efforts of the Live Stock Branch. The Branch has suggested a standard for the grading of live poultry, and, if the buyers will base their quotations on these standards, it will assist the producers in disposing of their stock to good advantage, and, at the same time, it will result in better satisfaction to the buyers themselves. All this should result in a better class of stock being provided for the consumers. The Live Stock Branch is encouraging the buying houses to purchase on a quality payment basis with the idea encouraging producers to properly fatten and prepare their birds for market. The buying houses are impressed particularly to offer special premiums for crate or pen fattened chickens. The standards suggested by the Live Stock Branch are as follows:

Broilers	One grade	Not over 2 lbs.
Chickens	Two grades	(2 lbs. to 4 lbs. (4 lbs. and over.
Fowl	Three grades	(4½ lbs. and over. (3 lbs. to 4½ lbs. (3 lbs. and under.
Old Cocks	One grade	
Ducklings	One grade	
Old Ducks	One grade	
Geese	Two grades	(Old (Young.
Turkeys	Three grades	(8 lbs. to 10 lbs. (10 lbs. and over. (Old Toms.

All birds must be plump, well finished, and not deformed or diseased.

A premium paid for crate fattened chickens and pen fed ducks.

WINTER EGG PRODUCTION

By M. A. Jull, Macdonald College

In practically every household in the city fresh eggs are extremely rare throughout the winter months. This is also true in some farm homes where, as a matter of fact, with a little attention given to the laying stock fresh eggs could be available at all times. On the average farm fresh eggs should be plentiful from the first of December until the following summer. One of the first essentials to insure the production of eggs during the cold months of the year is good stock. The birds should be well developed, hatched early enough in the season to allow them to be fully matured at the beginning of the laying season, and then, when they are put in the laying pen, they should be selected with great care. Having good stock, other conditions are simplified. On the other hand, birds will not lay well unless given good attention. A good laying house is necessary, one which will provide suitable protection and give plenty of room. The house should be dry at all times, since dampness in a poultry house seriously affects the health of the flock. The house should also be provided with fresh air, but, at the same time, all drafts should be avoided. Open front houses are proving quite satisfactory in the coldest districts of Quebec. Where the front of the house is open, however, the other three sides should be built draft-proof. The house should be convenient and easy to clean since sanitation means so much in maintaining the health and vigour of the flock.

The method of feeding may be simple but the grains provided should be wholesome and they should be well fed. The feeding should be done in such a way as to induce the hens to take plenty of exercise. Whole grains should be scattered in the litter where the hens will have to scratch for practically every kernel. Through exercise, hens tend to keep in good thrifty condition and are inclined to lay much better than where the feed is simply thrown in piles before them. Wheat, corn and oats are usually used when feeding whole grains. These may be mixed in varying proportions or wheat and oats may be fed in the morning and corn in the evening. Besides whole grains, ground grains are essential and these may be fed in the form of a dry mash or a wet mash. The ground grains usually employed include wheat bran, corn meal, ground oats and middlings. The proportion in which these grains are mixed may vary, although bran is often used in larger quantities than the other grains. Some form of concentrates, such as gluten meal or beef scraps (which is an animal food) are often added to the ground grain ration. Satisfactory results are often secured where the latter is fed dry, being placed in hoppers and kept before the birds all the time. Some poultrymen prefer to keep the hoppers closed in the mornings, thus preventing the birds from eating any dry mash and compelling them to scratch for the grain in the litter. This mash ration may also be fed wet, in which case only a small quantity should be fed each day. One difficulty in feeding wet mash is that poultrymen and farmers are inclined to over-feed, which induces the hens to get too fat. Just give the birds what they will eat up clean within a few moments after being fed. Besides grains and mash, green food and animal food are necessary. The latter has already been mentioned in one form, that of beef scraps. Other forms of animal food include skim milk and green bone. Skim milk makes one of the best of our poultry foods and whenever available should be given the laying stock at all times. Green bone is also good where it can be procured at reasonable prices and it

Well finished roasters suitable for the Christmas market. Rhode Island Reds and White Wyandottes, shown in this illustration, make fine table birds. Note particularly the excellent fleshing with plump breasts, long keep and stout thighs. These birds were crate fattened for three weeks and they possess the quality which commands top price and makes largest profits.

should be fed with great care, allowing about ½ oz. per bird every other day. For green food, it is customary to give the fowls sprouted oats, mangels or turnips. Well cured alfalfa and clover hay may do, but these are not as succulent as the first three forms mentioned. Sprouted oats are certainly very good and it will pay any one to sprout them for their laying stock. It is advisable to keep grit and oyster shell before the birds at all times. Oyster shells supply the fowls with calcium for the formation of the egg shell. Above all, poultrymen who wish to secure eggs in winter must remember that exercise induces eggs and hens must be fed in such a manner that they will be induced to take all the exercise possible.

WOMAN'S WORLD

DUNHAM HOMEMAKERS' CLUB

THE Annual Meeting of the Dunham branch of the Homemakers' Club was held at the home of Mrs. Meltons, Main Street. It was unanimously decided that the Homemakers' Club amalgamate with the Red Cross Society until the end of the War, it being thought that greater and more efficient work could be accomplished by this means. The date of meeting was changed to the third Thursday instead of the third Saturday in each month. The present officers were unanimously re-elected for the coming year.

On the 27th October the Club was visited by Mrs. George M. Beach, County President, accompanied by Miss Frederica Campbell, Macdonald College Demonstrator, who addressed the meeting. In a most pleasing and distinct manner Miss Campbell laid before her hearers the definite aims of the Society, terming the Homemakers' Club, the "most truly patriotic organization existing", as may be understood by anyone who correctly interprets our motto *"For Home and Country."*

"True homemakers, "said Miss Campbell, "were developing the real spirit of the best character builders of our land. No nation is better than its homes, the homes being the real foundation of our national welfare".

Miss Campbell then dwelt on the classification of foods, saying that as medical science increased it demanded intelligent feeding, also showing the need of self control along the lines of appetite, etc. These addresses always prove very instructive and interesting, and are greatly appreciated by the Club.

The question of work among the schools was then discussed. The President, Mrs. G. F. Yates, then called on the Secretary, Miss E. L. Baker, to report in the work of the executive at their annual meeting. Miss Brown moved that a vote of thanks be extended to Miss Campbell for the clear, practical address of the afternoon. The National Anthem was then sung, and the meeting adjourned.

HARRIET J. GILBERT,

Press Correspondent,
Dunham, Que.

FOODS AND FOOD PREPARATON

Lesson XXI

Flour Mixtures (Continued)

SCHEDULE FOR POUR BATTERS

Name	Flour	Liquid	Sugar	Salt	Shortening	Eggs	Lightening agent	Flavoring	Other Ingredients
Waffle	1¾ c.	1 c. milk		½ teasp.	1 tblsp. melted butter	2	3 teasp. baking powder		
Yorkshire Pudding	1 c.	1 c. milk		¼ teasp.		2			
Sour Milk Griddle Cakes	2 c. white or buckwheat	2 c. sour milk		½ teasp.		1	1 teasp. baking powder		
Rice Griddle Cakes	2½ c.	1½ c. milk	¼ c.	½ teasp.			1 teasp. baking powder		½ c. cold cooked rice.
Fritter Batter	1 c.	⅓ c. milk	3 tblsp. castor	¼ teasp.		1	1½ teasp. baking powder		
Timbale Batter	¾ c.	½ c. milk	1 teasp.	½ teasp.	1 tblsp. olive oil	1			
Popovers	1 c.	⅞ c.		¼ teasp.	½ teasp. melted butter	2			

Name	REMARKS
Waffles..	Fold in stiff whites at last. Beat yolks well and add to milk. Cook on greased well-heated waffle iron. Serve with maple syrup.
Yorkshire Pudding	Add well beaten, whole eggs at last.
Sour Milk Griddle Cakes...	Sauté by spoonfuls on hot greased griddle. When cakes are full of bubbles on top and brown on under side, turn, to brown other side. Never turn griddle cakes twice. Always beat batter well before pouring on griddle. Serve at once with butter, butter and sugar, or butter and syrup.
Rice Griddle Cakes...	Cook on greased, very hot griddle as sour milk griddle cakes. A cube of fat pork on a fork may be used each time for greasing griddle.
Fritter Batter	Coat prepared fruit with batter and fry in deep fat as for raw mixtures.
Timbale Batter	Immerse timbale iron in hot fat until well-heated. Have timbale batter in cup. Immerse iron in batter to ¾ its depth. Cook in hot fat at temperature of 360°F. until crisp. Take from hot iron and drain, inverted on brown paper.
Popovers...	Add well beaten whole eggs at last. Bake in hot oven in buttered very hot muffin tins or cups, about thirty-five minutes. Small, round iron gem pans are best.

Method of making Pour Batters (not used for sponge cake).

1. Mix and sift dry ingredients.
2. Mix all liquid ingredients.
3. Combine by adding *gradually* the dry ingredients to the liquid, then beat well to remove lumps.

Method of making Sponge Cake Mixtures

1. Have ready a moderate oven.
2. Have all material at hand before beginning to mix.
3. Mix dry ingredients together and sift.
4. Use only *fresh* eggs. Beat yolks until thick and lemon colored, reserving 2 tblsp. sugar for each egg white, add remaining sugar to yolks and beat until sugar is liquefied. Add flavoring to yolk mixture. Make a meringue of the whites.
5. *Fold* the meringue into the yolk mixture.
6. Sift a thin layer of dry ingredients over egg mixture and *fold* it in. Continue until all is added, being careful to add only a thin layer at a time. (Use a tablespoon for folding).
7. Pour into greased pans and bake in a moderate oven.

Potato Flour Sponge Cake.

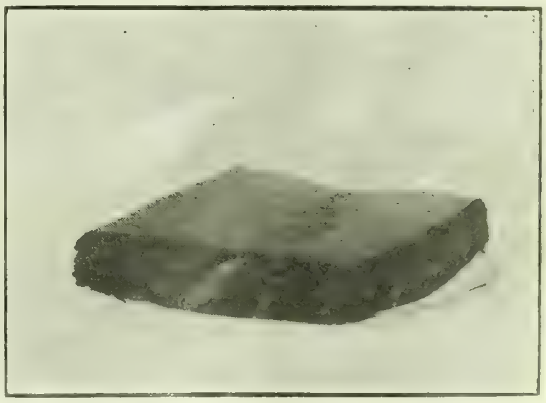
6 eggs,
¾ teasp. salt.
4½ tblsp. white flour.
¾ teasp. lemon extract, or juice of half a lemon.
1⅛ c. castor sugar, or fruit sugar.
7½ tblsp. potato flour.
1½ teasp. baking powder.
½ teasp. almond.

This makes a very large cake. Two-thirds of the mixture is plenty for a 7½" square tin.

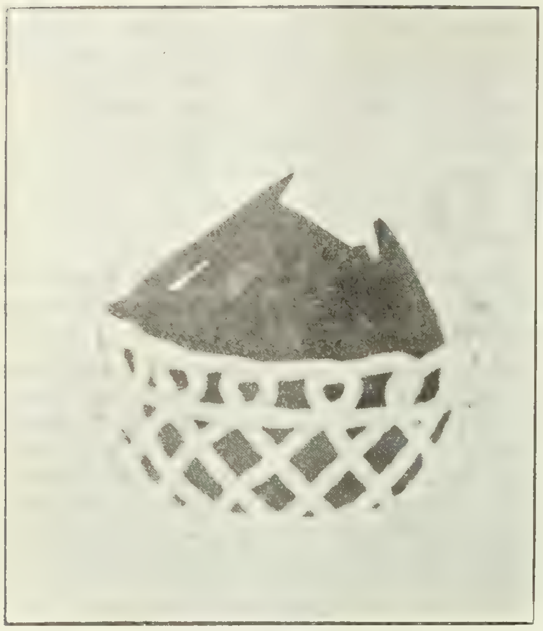
Hints for success.

A butter cake often tastes better than it looks, the reverse is often true of a sponge cake. To be perfect the sponge cake must be light, feathery and *delicately flavored.* The main secrets of success are:

1. Beat the white until little more than frothy. Pour the sugar lightly around the sides of



SPONGE CAKE.—Light, feathery and delicately flavored.



GINGER SNAPS.—Crisp and wafer like.

the bowl and beat with the Dover beater until a meringue is formed.

2. When adding the meringue to the yolks make only three folds.

3. See that the flour is thoroughly *folded* in, but *never* beat, or stir the mixture.

4. The cake should be placed in a moderate oven and the oven door should not be opened for the first ten minutes. The heat should then be turned to low, to complete the baking. Twenty-five minutes is usually sufficient. Whenever the cake is set remove at once from the oven. If it shrinks before taken from the oven it will be dry.

5. The juice of a lemon gives an excellent flavor.

6. If an icing is desired, Mocha icing, sprinkled over the top with nicely browned almonds, adds still more to this delicious cake.

Four Mixtures requiring special methods

No. 1. *Ginger Snaps.*
2 cs. molasses.
½ c. lard.
2 teasp. soda.
½ c. butter.
2 teasp. soda.

Dissolve soda in ¼ c. boiling water. Add to above ingredients. Set mixture on stove until it comes to a boil. Cool. Add sufficient flour to roll out. Roll out very thinly on a floured board. Shape with a cutter dipped in flour. Place closely together on a buttered sheet and bake in a hot oven.

No. II. *Ginger Snaps.*
1 c. brown sugar.
1 c. molasses.
1½ teasp. soda (rounded).
1 c. butter.
3 teasp. ginger (rounded).
(Follow directions for mixing No. I).

NUT AND RAISIN BREAD.—Excellent for the school lunch sandwich.

Cream Puffs.
½ c. butter.
1 c. boiling water.
¼ teasp. salt.
4 eggs.
1 c. flour.

Put water, salt and butter in a saucepan. As it begins to boil stir in quickly the flour. Cook, stirring constantly until the mass leaves the sides of the pan in a smooth ball of paste. When cool, add the eggs, one at a time, beating well from ten to fifteen minutes. Drop on buttered pans, bake about thirty minutes in a moderate oven, or until light and dry. It is well to start them in a hot oven and then reduce the temperature to moderate.

Filling for Cream Puffs. (Cool before using)
1 c. milk, or
½ c. cream and ½ c. milk.
2 tblsp. flour.
1 egg, or 2 egg yolks.
3½ tblsp. sugar.
1 teasp. flavoring.

Nut or Raisin Bread.

Sift together 4 cups flour and 4 teaspoons baking powder. To one-half of this add 1 cup chopped walnuts and ½ cup raisins. Beat together ¾ cup sugar, one egg and 1½ cups milk. Add sifted flour, then the remaining flour with the fruit. Put in well greased pan (Baking powder tins make nice loaves). Let rise for 20 minutes in a warm place. Bake from 45 to 50 minutes according to size of loaf in a moderate oven.

Note: Cut in thin slices and buttered this bread makes delicious and nourishing sandwiches for the school lunch. Dates may be used instead of nuts and raisins.

Dumplings (for Stew).

A *soggy* dumpling is most unappetizing and indigestible. It is just as easy to make them light and fluffy as otherwise. Use the recipe for Baking Powder Biscuit:
2 cs. flour.
½ teasp. salt.
Sufficient milk to make a stiff drop batter (about 1 cup).
4 teasp. baking powder.
2 tblsp. butter.

Drop in spoonfuls into the stew, which must be boiling gently. Place cover on tightly and *do not remove for* 12 *minutes.* Then uncover and remove dumplings from the liquid *at once.*

F. CAMPBELL

CANDY

THE celebration of Christmas always calls for a supply of goodies such as every day living does not provide, something especially attractive in appearance and toothsomeness. Following are some recipes, wholesome and delicious, and capable of being made at home. Homemade candies have this advantage over those purchased in the shops, they are much less expensive, they are wholesome and safe since one knows exactly what ingredients have gone into them, and they are always perfectly fresh.

Good candy eaten in judicious quantity and at the proper time is beneficial and is thoroughly enjoyed by children.

Pure sugar is one of the most important articles of food since it is very easily digested, easily and thoroughly assimilated and such an important source of muscular energy that it is frequently given to athletes in training and to race horses in preparation for a race. Sweetened chocolate is supplied to soldiers on the march, and those who recall the Boer war will remember that Queen Victoria's Christmas gift to the troops was a box of chocolate.

These facts about sugar must not be taken by candy lovers as an excuse for unlimited indulgence in their favourite sweet. Because of the very ease of its digestion sugar may be a menace, for if there is no great demand for an expenditure of muscular energy the sugar is probably not needed and the excess is converted into fat, if digested, and if not, as in the case of persons of weak digestion, it is changed into acid, which will interfere with the digestion of other foods. Candy eating is claimed to be the direct cause in children of early decay of teeth, but there seems little ground for this belief, since the negroes who eat a great deal of sugar cane have particularly fine teeth. Candy may be indirectly responsible for decay in the following ways, either by particles of sugar clinging about the teeth, changing to acid and thus causing decay, or the eating of sweets before a meal destroying the appetite for regular food, especially of a vegetable nature, thus causing the lack to the system of the valuable mineral ingredients in the vegetables, a consequent thinness of the blood and as a result the development of caries, a common disease of the teeth. This leads us to the proper time for candy eating. It should be taken *after*, not *before* or between meals. One or two pieces of homemade candy at the end of a meal is a valuable addition to the meal itself.

The foundation of all cream candies is a fondant which may be prepared and kept for some time, using it as desired. It may be colored and flavoured in a variety of ways and can be used to coat other sweets, nuts, or fruits, or itself be coated with other materials.

Bon-Bon Cream (Fondant).
5 lbs. granulated sugar.
6 drops acetic acid.
1½ pts. cold water.

Have all articles conveniently at hand. Place the table in a position where the air will strike it on all sides, from a door or window. Be sure that it is level and that you can pass around it. Arrange the kettle in the most convenient manner, so that when you lift it off the stove you will not have to turn it about or jar it unnecessarily, as this is sufficient to spoil the syrup.

Put the sugar and water into the kettle and place it over a *hot fire* (it must boil quickly and not be allowed to simmer), and stir constantly until it commences to boil. It is not necessary to stir quickly, but the sugar must not be allowed to settle. *Use the wooden paddle* or spoon to stir with, and splash the syrup against the sides of the kettle to wash down the granulations. Just before the syrup begins to boil, wipe down the sides of the kettle with a damp cloth and *be sure that there are no granulations on the sides of the kettle,* because unless they are removed they will make the fondant gritty, or the syrup may be poured into a clean saucepan. *Never stir the syrup after it begins to boil. Never jar or move the kettle while the syrup is cooking.*

When the syrup begins to boil, add the acetic acid. Drop it carefully on a spoon. *Too much acid* would spoil the candy. Put the lid on the kettle and let it steam for several minutes. This is done so that the steam will wash down the sides of the kettle and remove some remaining grains of sugar that might be sticking to the sides. *It is very important that all of these grains should be removed.* Do not remove the lid until the steam is coming out freely around the edges, because it does not matter if the lid is left on a little longer than three minutes.

Remove the lid and put in the thermometer, so that the bulb is covered with the syrup. The thermometer may be read more easily if it is fastened to the kettle by a hook on the back of the case. If a black scum appears on the surface do not disturb it until it gathers into a bunch, then carefully remove it by using a spoon and do not disturb the syrup.

While the syrup is cooking, prepare the slab by washing it with a damp cloth. A marble slab is best for working the fondant upon, but a large platter may be used instead. Do not dry it, and *never grease the platter when making fondant.*

When the thermometer registers 238° (remember to make the correct allowance if your thermometer does not register 212° in boiling water), remove it quickly. See that your way is clear, lift the kettle off the stove and carry it to the slab, taking great care not to shake the syrup. Pour the syrup on the slab or platter, beginning in the centre at one end of the slab, pouring down towards the corner, and while doing this, keep the kettle as close to the slab as you can, and at the end quickly tip up the kettle so that it will not drip. *Never allow the last of the syrup to drip out over what you have already poured on the slab. Never scrape out the kettle,* because these drops and scrapings will granulate, and when the syrup is cold there will be sugared spots on top. If this should occur they must be removed before the sugar is worked, because they would make the fondant gritty. *Never move the table or platter while the syrup is cooling, as this would ruin the candy.* Allow the syrup to remain on the slab until cold. Test it by using the back of the hand, as it is more sensitive than the palm. *When the syrup is cold it is ready to be worked.* Then it should be as smooth as glass.

Working the Fondant

If a slab is used instead of a platter, remove the bars by running a corner of the scraper between them and the syrup.

With the scraper, wooden paddle or spatula, commence by scooping or turning the syrup toward the centre so as to get it into a mass in the centre of the slab. Continue turning it over and over; always work from the edge and keep the scraper in one position. The mass will move from one end of the slab to the other, but by always working around the edge, you will be able to keep the syrup in a mass and prevent it from spreading over the slab. Each time you turn up the syrup, scrape the slab clean and turn the scraper up and over the mass. This movement removes the syrup from the scraper and when it works up to the handle, clean the scraper with a knife. Sugar will soon appear on the underside of the scraper, but this is only an indication that the syrup is reaching the creamy stage, when it will become much thinner and easier to work.

When this stage is reached, work rapidly and in a short time it will become harder and finally become a hard ball when it is finished. Scrape off any remaining particles on the slab; clean the scraper, and put this sugar on the batch. Wring a heavy cotton cloth (such as a piece of toweling) out of *cold water* so that it is damp, and place this cloth over the fondant on the slab; tuck it in on all sides, allowing it to remain for a half-hour. This sweats or seasons it and mellows the fondant. Remove the cloth and your efforts will be rewarded by a mass of snow-white fondant, smooth as velvet. Cut it into pieces and put them into a crock or stone jar. Wet the cloth, (wring it out well), and lay it over the top of the crock. It must not touch the fondant, because the cloth will draw the syrup and absorb the moisture of the fondant. In three days it will be ready for use.

The fondant may be kept six months in a dry, cool place. Keep the cloth moist. You may have the delicious bon-bons at any time, as the fondant is always ready for immediate use.

Maple Fondant

2 lbs. maple sugar.
1 lb. granulated sugar.
1 pt. water.

If you cannot procure the maple sugar, use the following recipe:—

4 lbs. maple syrup.
1 lb. granulated sugar.
½ pt. water.

Maple fondant is made in the same manner as bon-bon cream, omitting the acid.

Marshmallows

3 c. sugar.
1 c. water.
1 box gelatine.
1 c. water.
2 teasp. vanilla.

Soak gelatine in cold water fifteen minutes. Make a syrup of the sugar and water and pour it over the dissolved gelatine. Simmer ten minutes. Add vanilla. Beat until very white and thick. Mould, cover closely, stand over night if possible, cut in squares and roll in powdered sugar or toasted grated cocoanut.

Mexican Candy

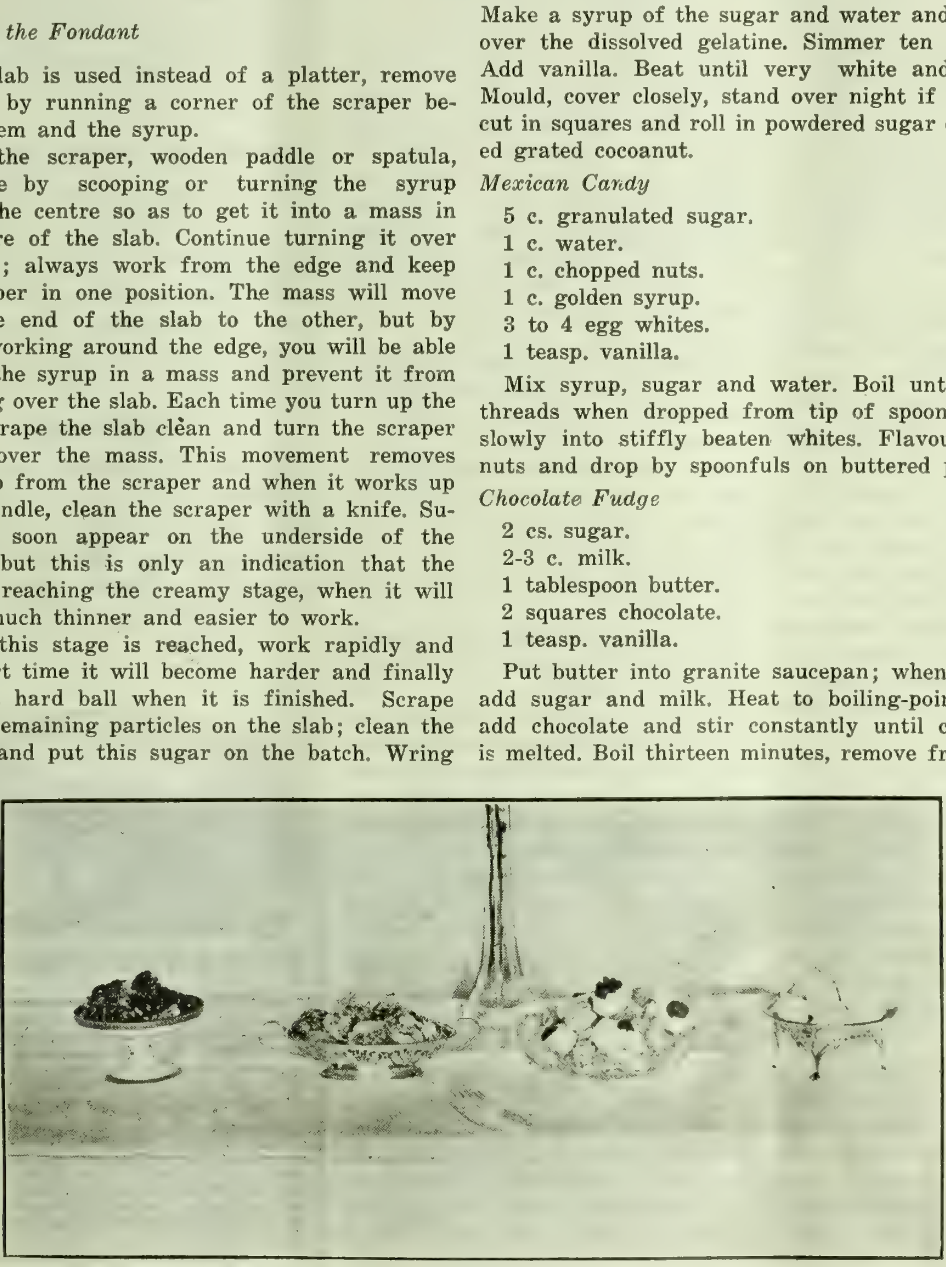
5 c. granulated sugar.
1 c. water.
1 c. chopped nuts.
1 c. golden syrup.
3 to 4 egg whites.
1 teasp. vanilla.

Mix syrup, sugar and water. Boil until syrup threads when dropped from tip of spoon. Beat slowly into stiffly beaten whites. Flavour, add nuts and drop by spoonfuls on buttered paper.

Chocolate Fudge

2 cs. sugar.
2-3 c. milk.
1 tablespoon butter.
2 squares chocolate.
1 teasp. vanilla.

Put butter into granite saucepan; when melted, add sugar and milk. Heat to boiling-point; then add chocolate and stir constantly until chocolate is melted. Boil thirteen minutes, remove from fire, add vanilla, cool slightly, then beat until creamy and mixture begins to sugar slightly around edge of saucepan. Pour at once into a buttered pan, cool slightly, and mark in squares. Chopped walnuts make this fudge doubly delicious.



Home made Christmas Candies.

Glacé Nuts

2 cs. sugar.
1 c. boiling water.
⅓ teasp. cream of tartar.

Put ingredients in a smooth saucepan, stir, place on range, and heat to boiling-point. Boil without stirring until syrup begins to discolor, which is 310°F. Wash off sugar which adheres to sides of saucepan, as in making fondant. Remove saucepan from fire, and place in larger pan of cold water to instantly stop boiling. Remove from cold water and place in a saucepan of hot water during dipping. Take nuts separately on a long pin, dip in syrup to cover, remove from syrup and place on oiled paper.

Toffee

2 c. brown sugar.
½ c. water.
1 tablesp. butter.
½ teasp. cream of tartar.
1 teasp. vanilla.

Put butter in a granite saucepan and when melted stir in sugar and water. When boiling well add cream of tartar. Boil until it threads or forms a hard ball when dropped in cold water. Pour out on a platter and when cool enough to handle pull until white. Add the flavouring while pulling.

B. M. PHILP,

Macdonald College

ONLY HEALTHY ANIMALS ARE PROFIT PRODUCERS

By W. A. Henry and F. B. Morrison, Agriculture Experiment Station of the University of Wisconsin

SUNLIGHT is a most effective germicide. To prevent the contraction or spread of disease it is therefore important that the stables of farm animals be well lighted, with the possible exception of fattening animals feeding for short periods of time.

For the maintenance of health, exercise is another essential. The only exceptions to this rule are fattening animals soon to be marketed which make more rapid gains if not allowed to move about too freely. Abundant exercise is of special importance with breeding animals.

Farm animals are creatures of habit, and once accustomed to a routine of living show unrest at any change. The feed stable or lot, therefore, should be free from disturbance, and the providing of feed and water should be uniform in time and manner. Animals soon learn when these are to occur and as feeding time approaches the secretions begin pouring from the various digestive glands in anticipation of the coming meal. The system of feeding and watering and the character of the rations should be changed gradually, and only for good cause. In feeding operations a changing period is usually a losing period.

No permanent system of agriculture has yet been devised which did not include live stock, and agriculture is the basis of our bank accounts. Upon it rests the commerce which feeds and clothes the world, the transportation which distributes where needed and the banking systems which pay the bills. The prosperity of the farmer is the prosperity of the world, and live stock is its carburetor.—I. D. GRAHAM.

In North Dakota the average distance of all farms from a railroad is seven miles. In New Jersey you can hardly get that far away from a railroad.

OF GENERAL INTEREST

JACK'S MOTHER

(A tale of two Christmas Days)

By Margaret Grant Mac Whirter, New Richmond, P. Q.

IT was Christmas Day. The winter sun shone in all its glory over the snowy fields, reflecting from the icy patches an array of dazzling colours. All over the land children and their elders were awaking to a new Christmas Day; the glad anniversary of a joyous event, world-wide, and boundless as eternity in its blessings.

For children, well-filled stockings: love-gifts from parents and friends, many of whom looked back with a sigh to their own youthful days, or forward with mingled feelings towards the future; then resolutely set themselves to make the day a happy one for the little ones.

But in a farm-house in one of the populous districts upon a hill overlooking Bay Chaleur this Christmas morning there was only anxiety. The doctor looked grave, while the two women who obeyed his orders moved quickly and quietly. Downstairs in the large, comfortable, living-room a man sat, with his arms upon the table supporting his bowed head.

Presently he started to his feet and walked to the front window overlooking the bay. He was a large, rugged, well-built man, but his face was unwashed and haggard from his long vigil. The mountains were clothed with snow, those stern, solemn hills which rose in majestic grandeur: the green of the spruce and fir intermingling with the panoply of snow. But he saw nothing of the beauty of the morning, nor the scenery which had hitherto found a response in his Celtic nature. Likewise the booming of the sea, as it beat upon the rocks, fell unheeded on his ears. How often his wife and he had stood side by side at that window, she observing that it was a typical Canadian sea-side scene.

To-day he looked with unseeing eyes; all his thoughts were with her.

Time passed, a step sounded upon the stairs, the door opened, and he turned to meet the doctor with a terrible fear at his heart.

"Good news, MacIntosh! There's a fine boy upstairs for a Christmas box".

"Thank God"! Burst from the usually silent man, and the look upon his face was the bright shining of the sun into a dark recess, lighting it into beauty.

"Ay, thank God": responded the doctor.

Later he stood beside his wife. Following her glance, with great cautiousness he stretched out a light finger to touch a little velvet cheek; then he stooped and kissed his wife. In both their hearts was a great joy. Such a happy Christmas Day!

Twenty-five years have passed, and again it is Christmas Eve. The short winter day had drawn to a close. In the snug, home-like, living-room where a quarter of a century ago John MacIntosh had awaited the doctor's verdict, he and his wife kept each other company. She was a woman of medium height and slight of stature, with snow-white hair, but not because of age; the strong resolute face was marked with lines, either traced by sorrow or illness. A bit of knitting occupied her fingers, but it required only a casual glance to tell that her thoughts were far away, for a great sorrow lay hidden in the depths of the dark brown eyes.

John MacIntosh, still hale and hearty although past middle life, lay apparently asleep upon the sofa, the while watching her from beneath heavy brows: well he knew where her thoughts roved. They were with her boy Jack,—the baby who had come into their home twenty-five years ago. He was an only child; the pride of his mother, the hope of his father. Perhaps they were over-indulgent, yet they had tried to rear him aright. From earliest childhood he had been taught about God, and the right. He had seemed to listen; his childish questions were wonderful to them. He was bright with his studies, and they had rejoiced in all his successes.

Before they realized it he had approached manhood, and ere they knew had fallen into evil company, among whom he learned to taste the glass which leads to ruin.

Then came the end.

Pretty Joyce Sinclair, with her winsome ways, blue eyes and golden hair, touched the boy's heart, and the mother looking on was thankful, clinging to the hope that he would change for the girl's sake.

Alas for a mother's hopes! The reformation on which she had built such a bright future was only of short duration. Again he fell, and when he went back to Joyce, she gave him to understand that he need seek her no more. She had no notion for anyone who had so little respect for her or himself, since he preferred whiskey he could go.

Proud and angry, smarting under the sting of the truths she told him, Jack went home, announcing there his intention of going West. His mother tried her utmost to dissuade him; his father likewise set his face against it. It was all in vain. He bade the aching, breaking hearts in the old farmhouse farewell, and set his face towards the land of the "setting sun."

No one knew of the bitter tears shed by pretty Joyce in the seclusion of her own room, nor of the remorse she endured lest she had spoken too harshly, but as time passed it was noticed that she had acquired greater sweetness of disposition, and a little more gravity of manner. That was all; Joyce kept her own counsel.

John MacIntosh failed visibly. His wife wept in secret, so as not to add to his grief, but neither deceived the other, although fondly hoping that they did. Always good companions and true help-mates, they leaned more than ever upon each other.

Five years had passed, and for the last year there had been no word from Jack. How the loving, anxious eyes watched for the letter which never came.

Now it was Christmas Eve, and hope was well-nigh dead in their hearts. Slowly the hours passed. At length Mrs. MacIntosh rose from her chair, laid aside her knitting and noiselessly left the room. Her husband lying, motionless upon the sofa, followed her with his mind's eye.

He heard her slow step ascend the stairs (how light and elastic it had once been); then pass along the hall to her boy's room, — and silence. A sigh from the depths of the old man's heart sounded through the room, and a prayer ascended to the Father's heart above,—none the less earnest because no sound was heard. He wrestled, but there was no outward sign of struggle; although all the strong man's nature was enlisted in his entreaty.

On her knees beside Jack's bed the broken-hearted mother knelt and prayed for her boy, while sobs shook her frame, and tears streamed down her cheeks. She looked to God; she would not be denied; she must have an answer. Like Jacob of old, she refused to depart without a blessing.

"O God!" she cried, "Wilt Thou save my son"? Then she bowed her head and murmured, "Thy will be done".

Strong in faith, wonderful in prayer, full of mother-love she knelt at the throne of Him who is gracious to bless.

When she re-entered the sitting-room her step was lighter, her eye brighter. She had been face to face with God. She had come from her "Peniel". Henceforth she could trust Him.

John caught her hand as she passed beside him, murmuring "In His own good time, Mother".

This from her silent, reticent husband. He had understood all the time. She bent and kissed him with a new song in her heart. John's faith was strong,—how nearly hers had failed; surely God was good.

* * *

What of Jack, the son of love and prayer?

In the pride of his budding manhood he had gone from home. He would not have owned it for the world, but the sight of his father's grief, and his mother's agony over his wayward career had been hard to bear, and added to this had been an aching head and empty purse. He had found it impossible to break with his companions, who finding him genial in manner and free of hand had exerted their influence to keep him with them.

Make Money On Raw Furs

You can make money on the war if you send your raw furs to us. Europe can't get furs at home this year, and the demand is heavier than ever, because of the fashions. We have four branches in Europe and numerous connections, and can get higher prices there than others can. We pass these higher prices on to those we buy from.

Try Us and Find Out

Send us your first shipment on trial. You will get a check by return mail which will prove to you that we can make more money for you on your whole season's catch.

TRAUGOTT SCHMIDT & SONS
229 Monroe Avenue, Detroit, Mich.
Moscow—Paris—Leipzig—London

TRAPPERS --- FREE

FUR NEWS, big illustrated magazine, tells all about raw furs, trapping, hunting, fishing, fur farming, hunting dogs, woodcraft, guns, etc. Lots of good stories. Send 15 cents for 2 mos. trial subscription and get FREE valuable illus. Trapper's Guide. FUR NEWS, 71 W. 23rd St., New York. Room 168.

ABSORBINE STOPS LAMENESS from a Bone Spavin, Ring Bone, Splint, Curb, Side Bone, or similar trouble and gets horse going sound. Does not blister or remove the hair and horse can be worked. Page 17 in pamphlet with each bottle tells how. $2.00 a bottle delivered.

Horse Book 9 K free.

ABSORBINE, JR., antiseptic liniment for mankind. Reduces Painful Swellings, Enlarged Glands, Goitre, Wens, Bruises, Varicose Veins, Varicosities, heals Old Sores. Allays Pain. Will tell you more if you write. $1 and $2 a bottle at dealers or delivered. Book "Evidence" free. Manufactured only by W. F. YOUNG, P.D.F. 134 Lymans Bldg., Montreal, Can.

Absorbine and Absorbine, Jr., are made in Canada.

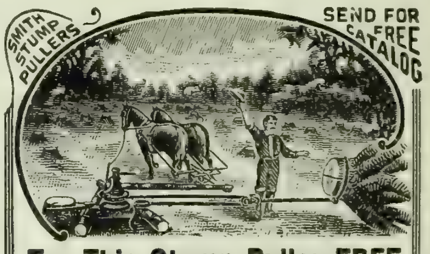
FREE PRUNING SHEARS

ATTENTION farmers! just to make our fruit trees better known: Apple-trees—plum-trees—pear-trees — cherry-trees, etc, etc., on the receipt of $5.00 we will ship by freight or express 12 No. 1 apple-trees, 5 to 6 ft. in height, assorted varieties. Our new pruning shears for trees absolutely free. Write at once. Ask for our free catalogue. Apply to FREGEAU BROS, Rougemont Station.

FOR SALE

Ayrshires — Yorkshires and Oxfords

AYRSHIRES all ages. Bulls fit for service—including our stock Bull Stonehouse Bell Boy, whose stock won 1st prizes at Exhibitions. Yorkshires all ages. Boars fit for service. Oxford Rams Lambs and yearling. Apply to HON. W. OWENS, or ROBERT SINTON,
Proprietor, Manager,
Riverside Farm, Monte-Bello, Que.



Try This Stump Puller FREE

We want a Smith machine on every stump and timbered farm in the country; it will clear from one to three acres a day, pulling the largest stumps and trees quicker than the holes can be bored for dynamite. The Smith Stump Puller will transform your waste lands into the most productive, while the first crop on one acre will more than pay for the machine.

Our Three Year Guarantee

We give you a guarantee to replace any casting broken on the Smith machine for three years from date of purchase. Our catalog tells you all about it, shows why the Smith Stump Puller is the most profitable implement made for farm use today, and explains our Special Introductory Offer and our Free Trial Proposition. Send us your name and we will send it free.

W. Smith Grubber Co.
32 Smith Sta., La Crescent, Minn.

Joyce Sinclair had made the finish. He tried to blame her, but in his honest moments felt that she was right. However, that was all over now, and as he said it he was conscious of a pang that it was all over. How pretty Joyce was! She had liked him once, he was sure of that. What a dear, good little girl she was!

"If only,——but no, he didn't care, so there!"

For a time he wrote home regularly. He soon found employment, and would have made money had he kept straight, but old habits asserted themselves, and often he was in no fit condition to work, and of course his power of resistance weakened with every fresh indulgence.

It was now nearly five years since he had come West, and almost a whole year since he had heard from home,—his own fault too.

Whenever he thought of them he was conscious of shame. His poor old father, his dear, good mother: they had deserved better at his hands.

He would pick himself up and do better, else he should never go home again. He supposed Joyce was married, by this time. If only, — but pshaw !

But one evening an acquaintance met him and persuaded him to attend a meeting in the Church. The minister was speaking on the story of the Prodigal Son and his words struck home to the mind and conscience of the young man who had wandered away to the Far Country. As result, he there and then decided to change his mode of living and to return home.

Mrs. MacIntosh replenished the fire, gave the already tidy room a few straightening touches; then she brought the Bible.

Suddenly she heard the kitchen door open, and a quick, sure step in the little hall. Hastily opening the sitting-room door to admit the latecomer she was caught in a close, strong embrace, while a manly voice exclaimed:

"Happy Christmas Mother! Hello, Father"!

With one loud, glad cry of "O my son ! my son!" she sank fainting in the arms of Jack.

"O Father, have I killed her? Have I only come home to do that"?

Hastily they administered such simple remedies as they knew, and ere long were rewarded by her return to consciousness.

"O Mother, Mother, I have sinned. Can you forgive me"? Cried Jack. "Hush, my boy, I have nothing to forgive", she said, as she laid her hand fondly upon his bowed head.

John MacIntosh rubbed his eyes suspiciously as he went to put another stick in the stove.

* * *

"Such a happy Christmas Day"! said Joyce Sinclair to herself, as she laid her pretty head upon the pillow.

IMPROVING THE LAWN

Timely Hints on Care and Management of Old Lawns — Treatment of Weeds

IMPROVING an old lawn is a very much more difficult problem than establishing a new one. In many cases it is impracticable to attempt the improvement of an old lawn that is in bad condition, say the specialists of the U. S. Department. However, if a reasonably good turf obtains, it is possible to better it materially by reseeding, fertilizing, and watering. In the majority of cases improvement is desired in the spring, since at this season many bare spots are in evidence as the result of the preceding winter. If the areas to be improved are small, they can be handworked and reseeded with little difficulty. If they are large, it is usually advisable to spade them up, work thoroughly, and seed, as in the case of starting a new lawn. In any event reseeding should be done early in the spring with a liberal quantity of a good seed mixture.

When the stand of grass is thin over the entire lawn or a greater portion of it, a special seeder equipped with small disks has been found very satisfactory for cutting the seed into the sod and thereby producing favorable conditions for germination and subsequent growth. In the early spring, however, the soil is usually loose as a result of the freezing and thawing and is in sufficiently open condition to permit the seed to be covered with little difficulty. After seeding, if the ground has become quite dry, rolling is usually beneficial. Care should be taken when mowing or watering the newly seeded areas to avoid disturbing the young grass. This caution also applies in a measure to fall seeding, although there is not so much danger of damage in this way at this season.

FERTILIZING

The management of the lawn after it is once established is an extermely important matter, and there are a few general practices that should be followed carefully. Beginning in the early spring, the first thing to do is to remove with a rake the top dressing that has been applied the fall before. After removing this it is usually advisable to apply some fertilizer, even though the soil is already reasonably fertile. One of the very best fertilizers for the lawn in the spring is nitrate of soda, but on account of its quick action and its caustic effect extreme caution should be used in its application. Five pounds of nitrate of soda are sufficient for 1,000 square feet of lawn, and if applied in solution with the watering pot and the grass then thoroughly watered with a hose, there is little danger of scalding. Bone meal is probably the best commercial fertilizer to use on a lawn, considering the danger from the misuse of nitrate of soda. Bone meal can be used without taking any special caution in its application, as it is in no way injurious to the grass. Eight pounds to 1,000 square feet is a liberal application. Any commercial fertilizer that is used should be applied early in the spring, when the grass begins to grow. In fact, bone meal can be used to advantage every month during the growing season, except perhaps July and August. Fertilizing through the season is especially beneficial in keeping the grass stimulated at times when it would otherwise be more or less inactive. Pulverized limestone as a top dressing is very helpful, and an application of this substance can be made either in the fall, winter, or spring. Lime corrects the acidity of the surface soil and is useful in checking the growth of moss and various other plants that are detrimental to the grass.

MOWING, ROLLING, AND SPRINKLING

There is no hard and fast rule to be followed in connection with mowing the lawn, but clipping twice a week is not apt to injure it, and will induce the formation of a good turf. Too frequent clipping, however, is a drain on the vitality of the grass and frequently results in permanent injury.

There is some difference of opinion as to whether clippings should be removed after mowing, but in general their removal is advised, especially during wet weather since if left to lie on the surface they are conducive to the growth of molds, which in turn produce injury to the turf. On new seedings, however, or where the grass is thin, clippings can frequently be allowed to remain with benefit.

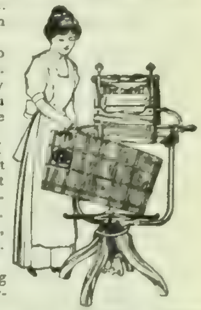
New seedings should not be clipped closely, and during the hot weather of mid-summer and early fall the mower should be set high for old and new grass alike. The roller should be used discreetly. New grass is frequently benefited by a light rolling after the first cutting. Old sod should be rolled in the spring to firm the surface that has been loosened by freezing and thawing, but during midseason it is very doubtful if the lawn should be rolled even lightly, especially where the soil is of a heavy nature.

There are probably more mistakes made in connection with the watering of the lawn than in any other phase of its management. The practice of sprinkling as it is almost universally followed is fundamentally wrong, not that the sprinkler does not furnish enough water to the grass during the season but that it does not furnish it in properly distributed quantities. Sprinkling for a short period may appear to wet the sod thoroughly, but in reality the water does not penetrate much below the surface. This encourages the formation of surface roots and makes the grass less resistant to the severe conditions to weather and usage.

Except in rare cases, the lawn should not be watered oftener than two or three times a week, provided watering is done properly. A through soaking is necessary and should be given in the late afternoon or early morning. The ordinary type of revolving spray is quite satisfactory, but the amount of water applied by it is usually much less than appears. The point to be borne in mind is that the ground should be thoroughly saturated

Every quilter should have our book of 450 designs, containing the prettiest, queerest, scarcest, most grotesque patterns, from old log cabin to stars and puzzle designs, also crazy stitches, also our book of cross-stitch designs, contains hundreds of designs and four complete alphabets for cross-stitch embroidery; very beautiful and easy to do. Both books sent for 25 cents. No stamps accepted.
LADIES' ART CO., Block, 153 St. Louis, Mo.

THIS WASHER MUST PAY FOR ITSELF



Our "Gravity" design gives greatest convenience, as well as ease of operation with quick and thorough work. Do not overlook the detachable tub feature.

A MAN tried to sell me a horse once. He said it was a fine horse and had nothing the matter with it. I wanted a fine horse, but, I didn't know anything about horses much. And I didn't know the man very well either.

So I told him I wanted to try the horse for a month. He said "All right, but pay me first, and I'll give you back your money if the horse isn't alright."

Well, I didn't like that. I was afraid the horse wasn't "alright" and that I might have to whistle for my money if I once parted with it. So I didn't buy the horse, although I wanted it badly. Now this set me thinking.

You see I make Washing Machines—the "1900 Gravity" Washer.

And I said to myself, lots of people may think about my Washing Machine as I thought about the horse, and about the man who owned it.

But I'd never know, because they wouldn't write and tell me. You see, I sell my Washing Machines by mail. I have sold over half a million that way. So, thought I, it is only fair enough to let people try my Washing Machines for a month, *before they pay for them*, just as I wanted to try the horse.

Now, I know what our "1900 Gravity" Washer will do. I know it will wash the clothes, without wearing or tearing them, in less than half the time they can be washed by hand or by any other machine.

I know it will wash a tub full of very dirty clothes in Six minutes. I know no other machine ever invented can do that without wearing the clothes. Our "1900 Gravity" Washer does the work so easy that a child can run it almost as well as a strong woman, and it don't wear the clothes, fray the edges nor break buttons, the way all other machines do.

It just drives soapy water clear through the fibres of the clothes like a force pump might.

So, said I to myself, I will do with my "1900 Gravity" Washer what I wanted the man to do with the horse. Only I won't wait for people to ask me. I'll offer first, and I'll make good the offer every time.

Let me send you a "1900 Gravity" Washer on a month's free trial. I'll pay the freight out of my own pocket, and if you don't want the machine after you've used it a month, I'll take it back and pay the freight, too. Surely that is fair enough, isn't it.

Doesn't it prove that the "1900 Gravity" Washer must be all that I say it is?

And you can pay me out of what it saves for you. It will save its whole cost in a few months in wear and tear on the clothes alone. And then it will save 50 to 75 cents a week over that on washwoman's wages. If you keep the machine after the month's trial, I'll let you pay for it out of what it saves you. If it saves you 60 cents a week, send me 50c a week till paid for. I'll take that cheerfully, and I'll wait for my money until the machine itself earns the balance.

Drop me a line to-day, and let me send you a book about the "1900 Gravity" Washer that washes clothes in six minutes.

Address me personally, O.K. Morris, Mgr., Nineteen Hundred Washer Co., 357 Yonge St., Toronto, Ont., (Factory: 79-81 Portlant St., Toronto.)

Horse Owners! Use
GOMBAULT'S
Caustic Balsam
A Safe, Speedy, and Positive Cure

The safest, Best BLISTER ever used. Takes the place of all linaments for mild or severe action. Removes all Bunches or Blemishes from Horses and Cattle. SUPERSEDES ALL CAUTERY OR FIRING. *Impossible to produce scar or blemish*

Every bottle sold is warranted to give satisfaction Price $1.50 per bottle. Sold by druggists, or sent by express, charges paid, with full directions for its use. Send for descriptive circulars.
THE LAWRENCE-WILLIAMS CO., Toronto, Ont.

at each application to at least 3 inches in depth.

ERADICATION OF WEEDS

While weed enemies of the lawn are troublesome throughout the growing season, they are particularly so from the latter part of June until frost. During this period crab grass is by far the worst weed present. There is no really satisfactory method of checking its growth, and the only treatment to be recommended is to cut or pull the plants before they have formed large mats. This is a very tedious and expensive practice, but where a good lawn is involved the results justify the expense. Rational fertilizing and careful watering during the summer help to overcome the effect of weeds. Chemical sprays or treatments have proved to be of very little assistance. Much difficulty is experienced in cutting crab grass with the ordinary mower on account of its semiprostate character. This difficulty can be overcome to a certain extent if a rake is used in conjunction with the mower. By means of the rake the branches of the grass may be lifted so that they can be clipped reasonably close. It is almost impossible, however, to cut crab grass sufficiently close to prevent the formation of seed.

There are many other weeds that are troublesome in the lawn not only in the spring but also in the summer and autumn. Among the most important ones are dandelion, plantain, chickweed, oxeye daisy, and yarrow. While chemical sprays are more effective in the eradication of these weeds than in the case of crab grass, the best method of preventing their development is to remove them with a spud or similar implement.

The weed problem can perhaps best be solved by making the conditions as favorable as possible for the lawn grasses and by maintaining a strict watch at all times to check the growth of the troublesome weeds at the beginning. At the end of the growing season before the severe weather of winter arrives the lawn should be given a good top-dressing of well-rotted barnyard manure. If the manure is not well rotted, it is likely to introduce an abundance of weed seeds, which will ultimately cause considerable trouble. Top dressing not only adds fertility to the soil, but gives the grass protection during the severe weather of winter and the freezing and thawing of early spring.

Farmers' Bulletin 494, on Lawn Soils and Lawns, may be procured on application to the Secretary of Agriculture, Washington, D. C.

A six-year-old Oak Park boy was eating peanuts. He ate them in the usual manner for a time, and then poked one up his nose. Not getting the desired results in that fashion he went crying to his mother. She tried to remove the peanut, and after failing in the attempt, called a physician. After the peanut was removed, the physician had gone, and things settled down to some extent, the mother began to demand an explanation.

"Why in the world did you want to poke a peanut up your nose, anyway?" she asked.

"Well," replied the boy in self-defense, that's the way elephants eat them."

President D. D. Aitken of the Holstein-Friesian Breeders' Association, in his recent annual address, stated that all the Holstein-Friesian cattle registered in the United States, estimated to be more than a half million, came from a total importation of 7,752. This does not include the Canadian Holsteins, which also sprang from these 7,752 animals.

HOW TO GET GOOD SEPARATOR CREAM

1. Skim only in a clean place, free from odours.
2. See that the separator and utensils are washed absolutely clean and scalded every time used.
3. Skim the milk as soon as possible after being drawn to ensure close skimming—adjust the separator to give a cream containing not less than 30 per cent butter-fat.
4. Cool the cream at once to 50 degrees or under, but in no case allow cream to freeze.
5. Do not mix cream with that of a previous skimming until cooled to 60 degrees or under, and stir well every time fresh cream is added.

Pat and Mike were crossing the river on a ferryboat. They were watching intently a big dredging barge that was sending its mammoth scoops under the water and bringing up tons of mud. "Pat", says Mike, "wouldn't ye loike to be a-workin' over there on that mud-digger?" "Yis," says Pat, "but Oi'd hate to be wan of the fellers under the water that's fillin' up thim shovels."

John Drew tells the following story of an actor now playing in England:

"He is quite a practical joker," observes Mr. Drew, "and his friends frequently try to get back at him, usually without success. Recently he received from a New York friend an unpaid letter containing nothing but this bief message:

"I'm quite well and in good spirits. Kindest regards. Your friend——.'

"The actor was rather annoyed at having to pay postal charges for such a piece of news, and the forthwith determined to retaliate. He motored out in the country and picked up a heavy stone, packed it in a box and sent it to the New York friend, marking the box 'Collect on delivery.'

"The New Yorker never doubted but that the contents were valuable, and gladly paid the heavy express charges due. Opening the box, he found, to his consternation and dismay, nothing but the stone and card, upon which was written:

"On receiving the news that you were well and in good spirits, the accompanying load rolled off my heart."

"MAPLE LEAF"
Stitched Cotton Belting
A BELT that is the most economical, truest running and strongest belt on the market. Being thoroughly waterproof it is particularly well adapted for general farm use such as threshing machines, gasoline engines and other farm machinery. Also suitable for saw mills, flour mills, etc.
ASK FOR "MAPLE LEAF" BELTING
IT IS CHEAPER THAN RUBBER OR LEATHER BELTING.
DOMINION BELTING CO., LIMITED
HAMILTON, ONT.
Montreal Office:—50 Notre Dame Street W.

VIGORA
THE BEST
PREPARATION FOR HORSES
"VIGORA" works wonders; it is the perfect tonic, makes good rich blood and the coat sleek and shiny. Sure cure for coughs, broken-wind, worms, skin-diseases, etc.
PRICE 50c A BOTTLE
ON SALE EVERYWHERE
Get all information from
J. B. MORIN, Wholesale Druggist
QUEBEC, CANADA.

TRAPPERS!
Furs Are Higher!
We pay big prices for Fox, Wolf, Beaver, Fisher and White Weasel and special prices for fancy skins of all kinds. Ours is an old established firm and we have the best market and outlet for furs in America. Right now the demand for raw furs of all kinds is enormous and prices are 'way up. You'll make more money by shipping to us. You are guaranteed liberal grading, full value and a square deal on every shipment. Write today for price list and shipping tags. Means money—so act quick. Write today sure!
NATIONAL FUR & WOOL CO.
Dept. 293 ST. LOUIS, MO., U. S. A.

SUNSHINE or RAIN
White's Weather Prophet forecasts the weather 8 to 24 hours in advance. Not a toy but a scientifically constructed instrument working automatically. AN IDEAL XMAS GIFT made doubly interesting by the little figures of Jean et Greta and the Witch, who come in and out to tell you what the weather will be. Handsome, reliable and everlasting.
DAVID WHITE
AGENTS WANTED
Size 6½ by 7½; fully guaranteed. Sent prepaid to any address in the United States or Canada for - - - $1.00
DAVID WHITE, Dept. 102 East Water St. Milwaukee, Wis.

BUSINESS FOR SALE
WISHING to go and live out in the country, I would sell my business for $2,500.00; net profit $1,000 a year. Would Exchange for small farm with house near the church and railway. I would also sell a summer residence in Laurentians, worth $1,000. E. A. CADIEUX, 124 Berri St., Montreal.

A GREAT PARCEL POST OFFER
A regular $4.00 Vacuum Clothes Washer complete with exhaust protectors and handle, Postpaid for only $1.75. Your money returned if not satisfied. Washes finest laces or heaviest blankets. Saves rubbing and wearing out of the cloths. $20 machines have been discarded for it. Order one to-day, don't wait.
Agents Wanted.
GRAND & McMILLAN,
Dept. KI
Box 353, Toronto

Ontario Business College
BELLEVILLE, ONT.
49th Year.
O. B. C. training qualifies you for the highest business career.
SEND NOW for the convincing catalogue to
Principal J. W. JOHNSON, F.C.A.

TO ALL SUBSCRIBERS of the JOURNAL OF AGRICULTURE
the management of "Le Canada" offers a yearly subscription of its Weekly Edition french, at the special price of 50 cents.
This advantageous offer will last only till the 1st of January 1916 next.
The Weekly Edition of "Le Canada" is published in French every Thursday, at 12 pages and contains a recapitulation of all the news of the war and most important events of the week.
Would be pleased to mail a copy upon request.
CANADA PUBLISHING CO. 73 St. James St. Montreal

The JOURNAL of AGRICULTURE

AND HORTICULTURE

Volume 19 January 1st 1916 Number 7

NEW YEAR DECORATIONS AND GREETINGS

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

Studebaker

FORTY Horse Power
7 passenger FOUR
$1195

Show us the hill this Car can't climb

Or show us the hill that you THINK it can't climb—and we'll give you the best demonstration of hill-climbing that you ever witnessed.

This Studebaker 4-cylinder car is the MOST POWERFUL car on the market at its price. With its motor INCREASED from 3½ x 5 to 3⅞-inch bore x 5-inch stroke, it develops and delivers FORTY Horse Power. And it is the ONLY 7-passenger, 4-cylinder car with a 3⅞ x 5, FORTY Horse Power motor at its price.

Owing to the high location of the carburetor, the 6-inch intake and the scientific design of the gas passages, it is the snappiest, most flexible 4-cylinder motor that you ever drove. In POWER and flexibility it equals most Sixes on the market.

But POWER alone is not the only reason that it stands supreme in the 4-cylinder market. Studebaker has set a new standard of VALUE for Fours. For while the price has been reduced from $1250 to $1195, nothing but the price has been decreased. In POWER, size and quality the car has been greatly INCREASED. And wherever materials were changed, BETTER materials were used, as for example, in the upholstery, which is the finest hand-buffed, semi-glazed leather.

From any angle—POWER, hill-climbing, performance on the roads, size, riding comforts or quality—this Studebaker FOUR stands in a class of its own—the GREAT value of the year. It is a "built-in-Canada" car—a car you can depend on—a car built on long years of experience in studying the farmer's transportation problems. See it at your dealer's—and write for 1916 Catalog at once!

STUDEBAKER
Walkerville. Ont.
Dept. F 45

More than 200,000 Studebaker Cars now in use

Four Cylinder Models	
Touring Car, 7-pass	$1195
Roadster, 3-passenger	1165
Landau-Roadster, 3-pass.	1495

Six Cylinder Models	
Touring Car, 7-passenger	$1395
Roadster, 3-passenger	1350
Landau-Roadster, 3-pass.	1695

F. O. B. Walkerville

Raw Furs

Beaver, Marten, Lynx, Foxes, Wolf, Skunk, Muskrat, Weasels, etc.

WANTED FROM ALL SECTIONS of CANADA

Every raw fur shipper who is looking for a better outlet for his raw furs should write at once for our price list. We are in a position to pay top market prices and will do so at all times. Let us hear from you.

Send for our price list—Now ready—We buy Ginseng.

Struck & Bossak, Inc., Importers of and dealers in raw furs, 164 West 28th St., New York.

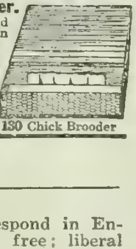
References on permission: Union Exchange National Bank, N. Y. 3-4

130 Egg Incubator and Brooder BOTH FOR **$13.90**

If ordered together.

Freight and duty paid to any R.R. station in Canada. Hot water, copper tanks, double walls, double glass doors. *Free* catalog describes them. Send for it today. Orders shipped from nearest Canadian warehouse.

130 Egg Incubator 10

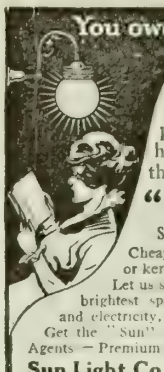


130 Chick Brooder

WISCONSIN INCUBATOR CO.
Box 214 Racine, Wis., U. S. A.

RELIABLE men who can correspond in English, to sell fruit trees, Outfit free; liberal commission. BROWN BROS. CO., Nurserymen Ltd., Ridgeville, Ont.

You owe it to your family.



Injured eyes can never be replaced. Protect them with proper light. Light your home, store, hall, church the new, *better, safer way,*

"SUN" LIGHT

Semi-Indirect and Direct for Gasoline

Cheaper than gas, electricity, acetylene or kerosene.

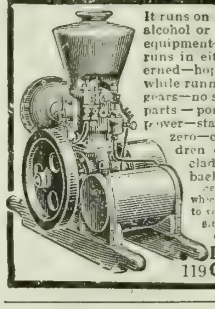
Let us show you how to make home "the brightest spot on earth." Fixtures for gas and electricity, also.

Get the "Sun" Light Book — Liberal Terms to Agents — Premium Offer. Don't Live in the Dark.

Sun Light Co., 1620 **Market St., Canton, Ohio**

YEARLY SUBSCRIPTION TO THE "JOURNAL OF AGRICULTURE" IS **ONLY $1.00.** IT IS WORTH TEN TIMES THAT AMOUNT TO THE FARMERS' HOME.

20 Reasons Why You Should Investigate the SANDOW Kerosene Stationary ENGINE



It runs on kerosene (coal oil), gasoline, alcohol or distillate without change of equipment—starts without cranking—runs in either direction—throttle governed—hopper cooled—speed controlled while running—no cams—no valves—no gears—no sprockets—only three moving parts—portable—light weight—great power—starts easily at 40 degrees below zero—complete, ready to run—children operate them—5-year ironclad guarantee—15-day money-back trial. Sizes 2 to 20 H. P.

Send a postal today for free catalog, which shows how Sandow will be useful to you. Our special advertising proposition saves you one-half cost of first engine sold in your county. 602

Detroit Motor Car Supply Co.
119 **Canton Ave., Detroit, Mich.**

FOR SALE

FINE Holstein bull, registered, 3 year-old, 2 cows, two registered calves (bulls) of the same breed for sale at low price. Apply to VALERE LABRECQUE, St. Benoit, Two Mountains Co.

FROM TRAPPER TO YOU

If you or any of your family want Fur Sets or Fur Garments, you cannot do better or buy cheaper than by dealing with us, no matter where you live.

We are the largest cash buyers of Raw Furs in Canada, purchasing direct from the trapper. This gives us an unrivalled opportunity to select the finest skins, manufacture them into desirable Fur Sets and Fur Garments for men, women and children, and by selling direct by mail, save the middleman's profits, and give you better goods for less money than you can obtain in any other way.

In order that you may better appreciate these remarkable values, send for our 1915-16 edition of our FREE **Fur Style Book** (containing 34 pages of illustrations of beautiful Fur Sets and Fur Garments) which will be mailed you FREE on request, and remember that all the prices quoted in our fur style book are for the goods delivered to you as

We pay all delivery charges

MINK SET

This beautiful mink stole and muff is a fair sample of the great values offered in our fur style book.

The Stole, style book No. 147, is made from natural Canadian mink skins, wide on shoulders, plain round back fronts trimmed with six natural Mink tails and paws, silk lined; a handsome neckpiece, moderately priced. Price delivered to you **$27.50**

MINK MUFF, style book No. 148, to match, made in large roomy pillow shape, silk lined soft down bed and silk wrist cord, showing five distinct stripes. Price delivered to you......................... **$27.50**

GUARANTEE

Every article shown in our Fur Style Book is sold under our positive guarantee to **"Satisfy you or refund your money."**

Do not wait but send to-day to

John Hallam Limited
Room 242 Hallam Bldg. TORONTO.

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 96,253
ENGLISH, 9,820
FRENCH, 86,433

Volume 19

JANUARY 1st 1916

Number 7

NEW YEAR GREETINGS FROM PROMINENT LEADERS IN AGRICULTURE

GREETINGS FROM THE MINISTER OF AGRICULTURE FOR QUEBEC

The Editor,
Journal of Agriculture.—

AT the approach of the New Year I send to you and to your assistant editor, and also to your readers, my best wishes for happiness and prosperity, wishes all the more sincere in that they are more deserved in the grave crisis through which we are passing.

In the midst of the devastation and ruin brought about by the present war, which is affecting nearly all the nations of the world, Canada, and in particular the province of Quebec, occupies a privileged position. At the present time it is our agriculture which constitutes the basis of our provincial prosperity and permits us to look forward with confidence into the future; and this agriculture is more than ever of supreme importance, not only in furnishing food for our population and our soldiers, but also in contributing in a large measure to the sustenance of the allied armies which are fighting for us, and to the assistance of the people depending on them.

It is our farmers who by their generous efforts have increased in value the natural resources which Divine Providence has so plentifully bestowed in our province, and it is they who have toiled and worked in order that Canada may merit her proud title of the "granary of the Empire."

In Quebec progress has been remarkably rapid and the annual value of our produce reaches to-day the sum of $100,000,000.

Our farmers are marching along the right road, but in order not to stop half-way, they should not neglect any opportunity of increasing their store of knowledge of the various requirements of their great profession.

In order to attain success in their agricultural industries, they should cease individual marketing and should unite in a spirit of co-operation and by this means decrease the expenses and increase the profits of their sales. In this way co-operative societies are able to assist the farmers with the greatest success.

Our good resolutions for 1916 may be found in the three words:—*Instruction, Work, Co-operation.* We wish with all our heart that the two noble races, French and English, who at the present time are uniting their efforts and giving their lives for the defence of civilisation against barbarism, may unite likewise in Canada to march hand in hand in the way of peace, prosperity and happiness.

J. ED. CARON,

Minister of Agriculture,
Quebec

GREETINGS FROM THE MINISTER OF AGRICULTURE FOR THE DOMINION

Editor, Journal of Agriculture.

YOU have asked me to send a New Year's greeting to the readers of the Journal of Agriculture and Horticulture, and I am glad to do so even if it is necessarily brief, owing to the heavy pressure of work at this special time.

War, which has laid so cruel a hand on the agriculture of Europe, has made many people realize more deeply how important a part agriculture itself must play in determining the great issues of war, and I think perhaps at no time in our history has there been so strong a realization by the people of this country of the necessity of maintaining and even increasing the volume of our agricultural products.

But, irrespective of the war, the status of the farms and of the farmers of Canada is a matter of vital import to the well-being of the whole State. No higher task could engage our energies than that of improving the conditions in our rural life and of placing agriculture on such a basis that it will not only attract more people to this great calling but will provide a life both healthful and interesting, and, to those who apply business methods and brains, as profitable as any which can be followed.

I have always regarded sound educational work as of the greatest support in achieving these objects, and it has been most encouraging of late years to see the fine spirit of co-operation which is existing throughout the country. We all appreciate the splendid and unselfish work which the women of Canada have done during this war. Their work in connection with the greater happiness of rural life is not less important, and it has been a pleasure to give financial assistance to many of the province for the purpose of strengthening women's organizations. I am sure also that the financial support for agricultural education in rural schools is achieving good results, and it is a pleasure to know that so many of the provinces are taking advantage of it.

It is not enough that a farmer should work hard to achieve the finest success but he has to work intelligently and sympathetically, and the great hope of our agricultural future is that the younger generation should feel a stronger interest in the problems of the land, and to solve them involves a love of nature and a determination to understand the great laws that govern plant and animal life.

There are many signs of progress in agriculture not only in your own beautiful province but throughout the whole of Canada, and I would have no fear of the future of this great country so long as the conditions of those who live on the land are getting brighter and better.

Believe me,
Yours very truly,
M. BURRELL

GREETINGS FROM THE COMMISSIONER OF AGRICULTURE FOR CANADA

Editor, Journal of Agriculture:

THE great war in which we have been engaged for the past seventeen months has been a trying out of the people of Canada. It has gone to the very souls of all classes. It has developed a liberality in the contributions of the people that must broaden their generosity, extend their sympathies, and establish new views as to responsibilities in regard to the uses of money; it has stimulated our people in work and production, proving what are the basic foundations of national prosperity; it has called forth the voluntary offering for service of the lives of our men, thereby elevating our national life and developing the noblest qualities in our people. And what of our women? It has been theirs to increase their household duties, to organize and plan for patriotic labours, and to send forth, with silent sorrow but unflinching devotion, the loved ones from their homes to serve their country in this most tragic struggle. And the end is not yet—the responsibilities, the duties, the sorrows are not yet ended. To them we look with confidence for even a larger spirit of devotion to the country's welfare. This is the opportunity for the women of the country to unite their efforts, to band themselves together in this common work, and to reveal to themselves the wonderful powers that they possess. Out of this may come a new force for the betterment of the Dominion. The co-operation of the women of the rural parts in working for the men at the front will surely lead to a broadening of their lives, a quickening of their ambitions, and a self-appreciation of their powers that will play an important part in the uplift of the whole rural community. There is a great, an important part to be played by the farm women in future Canadian life. To them this war has revealed new responsibilities and new duties, and through this war there should be stimulated movements that will lead to a greater consideration of their needs and their possibilities.

And what of the girls and boys in the rural homes? Have we done our duty to them? Have we really played the game fairly with them? This war is a testing of the value of individuals, men and women. What are boys and girls worth to this country? Largely what we make them. They are the products of our schools, our churches and our homes. You control your homes, you have some say in the direction of the churches—but what of the schools? Is there not an inclination to throw the responsibility of the schools upon other people and largely to put up with things as they are, to take what comes to us? We are entering on a New Year, and because of this war, we are entering on a new national life. Canada means not land and water, plains and hills — but people, Canadians. The boys and girls in your homes are your most

CONTENTS

NEW YEAR GREETINGS. — Greetings from Hon. J. E. Caron; Hon. M. Burrell; Dr. C. C. James; Hon. Sydney Fisher; Dr. F. C. Harrison; J. G. Foster Esq.; W. F. Stephen Esq.

EDITORIAL.—A Happy New Year.—Christmas numbers.—Short Courses by Macdonald College.—Agricultural Awakening in Quebec. — Quebec's Opportunity in the Production of Pork.— The Sheep and Dog Law.

ORCHARD AND GARDEN.—The Cost of a Barrel of Apples. Annual Meeting of the Quebec Pomological Society.—Progress of Fruit Growing in Quebec.—The Growing of Ferns in the Home.—Vegetable Seed Situation.

FARM AND FARM CROPS.—School Fairs in Compton County.—The Value of Crop rotation.

LIVE STOCK. — Local Pure-bred Sheep sales. —A Profitable Herd.—Market Requirements and the Profitable Production of Hogs.

DAIRY. — Sterilized Milk. — Food Colour Fads.

POULTRY. — Attend the Short Course. — Select your Breeders now.—The Present Condition of the Canadian Egg Market.—Poultry Conditions in Pontiac County. — Final Results at Storrs. — Extension of Poultry and Co-operative Marketing Associations in Canada.

WOMAN'S WORLD. — A Short Course in Dressmaking. — Foods and Food Preparation, (continued).

GENERAL INTEREST:—Farming for Women as a Livehood.—Successful Short Courses.— The Work of the Provincial Demonstrators.—The Children Homer — II. — Standardizing Canadian Eggs.—New Training for Rural Teachers in Quebec.-The Vegetable Garden.—The Angora Goat.— Winter Care of Stock.—Winter Feeding Hints.— The Idle Horse in Winter.—Winter Feeding of Pregnant Ewes. — Winter Feeding of Lambs. — Ashes as a Fertilizer.—To what Family do your Potatoes Belong?—Beef Raising in Canada.—One Farm that was made to pay.—Farm Management. —The Soils Store of Humus.—Diversity of Farm Enterprises.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

important contribution to your country. What of them? Are they getting the education that will best fit them to take up your work and carry it on in a bigger, better, more promising manner? We have become a serious people. Here is a question for you to consider deeply and thoroughly. The kind of education that your boys and girls will receive will in the future depend upon what you think, what you ask for, what you are willing to pay for. Why should your boys not have some instruction at school in the principles of agriculture and why should your girls not receive at school some training in the science of home work? Right training for rural life will come just as rapidly as the rural people demand it.

To the women of the farm homes we send New Year's Greetings, and for the boys and girls of the farm homes we hope for better things.

C. C. JAMES

GREETINGS FROM HON. SYDNEY FISHER, EX-MINISTER OF AGRICULTURE FOR CANADA

The Editor of the Journal of Agriculture,
and Horticulture for Quebec,

I have pleasure in writing a New Year's Greeting to the Journal of Agriculture and through it to the great number of intelligent and reading farmers of Quebec.

As a farmer in the Province and for many years and in various capacities officially connected with the development of agriculture I want to congratulate the Journal on its management and the great usefulness it is to the farmers of the Province. I want to congratulate the farmers of Quebec on the splendid advance that has been made during the last quarter century in their business. I venture to say that no part of the Dominion of Canada has made greater progress than this Province. To-day the farmers of Quebec are prosperous, their financial position is sound and they have developed a very considerable capacity of production and an increase in their capital investment, in stock, buildings and improvements on land. Study, reading and efficient management of the various agricultural organizations have contributed very much to this progress.

Dairying has become the mainstay of Quebec farming and, as in it lies the most highly developed branch of Agriculture, its adoption in the Province shows intelligence, enterprise, and sound business management. Farming is no longer a matter of haphazard work by rule of thumb or no rule at all. It must be conducted on sound business principles, improved methods and careful management. This involves foresight in planning, thorough work and accurate bookkeeping so as to know results. There is still large room for improvement amongst the average farmers in this respect but advances have been made.

The most important improvement still to come is better cultivation of the land so that greater average crops may be produced. The average return of the acre in Quebec is not what it should be, nor as much as in some other parts of the country. This is almost entirely due to lack of thorough cultivation of the soil. Farm management, rotation of crops, keeping of sufficient stock to maintain the fertility of the soil and thorough tillage, are the methods by which a greater crop production can be brought about. On some farms in Quebec this is shown to be successfully done. There is no reason at all that the other farms should not do as well if the owners and managers would take the same pains and apply the same intelligence.

There has been a call under the present conditions for greater production. Quebec should respond to that call and make every effort in this direction. Our rural population in Quebec on the whole live well, are thrifty, contented and out of debt, but improvement in the agricultural education in our rural schools is essential. I am glad to know that steps have been taken to supply this. I trust that the people will appreciate it and respond. Nature study and elementary agriculture is now a settled part of the curriculum of our Protestant rural schools and I believe has also had attention brought to it in the rural Catholic schools. This is as it should be and the parents and those who pay the taxes to support schools ought to encourage it, take an interest in it and help it on in every way possible. The parents of the children especially can contribute largely to this.

The women on the farms suffer perhaps more than the men when there is a failure to get the best out of conditions. The mass of the women, therefore, should watch closely anything that would tend to make their children more successful and better farmers. Interest in the School work and the improvements of the Schools on their part will accomplish a great deal.

I hope that the Journal will continue to deal with these important matters in the same able way it has been doing and urge still more strongly these and other points which make for progress.

Yours sincerely,

SYDNEY FISHER

GREETINGS FROM THE PRINCIPAL OF MACDONALD COLLEGE

A College Retrospect and Prospect

A great many people at the commencement of the New Year take a little leisure to review the past year's operations as they concern themselves and their business, and make plans for the coming year. Many, too, sow a new lot of resolutions which in some cases fall by the wayside, or become choked with the weeds of indecision and carelessness, whilst others bring forth good fruit, some thirty, some sixty, some a hundredfold.

Let us therefore first pass in brief review some of the doings of the past year as they concern Macdonald College and the agricultural community. Early in January 1915 short courses in live stock, field crops, horticulture, poultry and farm home were held at 22 places in the province. 58 meetings were held in 11 counties with a total attendance of 3500. Ninety addresses were given by seventeen members of the College staff. Winter short courses in horticulture and poultry keeping were held at Macdonald College for one and three weeks respectively with an attendance of 62.

During the year a new course in Nature Study and Elementary Agriculture was authorized by the Department of Public Instruction for elementary and model schools. The detailed outline of this course, which comprised two lessons a week for each grade, was prepared by Dr. Hamilton of our Nature Study Department.

The College has given much attention to this important subject and each teacher in training at Macdonald College has completed a year's work in this subject. Nevertheless there are a number of teachers in the Province, some teaching on permit, who have not had the benefit of such courses, and for these we were able to give a summer course of a month's duration with the object of helping these teachers to do better work along lines which make for greater efficiency on the part of pupils in rural schools.

Nearly ninety teachers attended this course. We must thank the Hon. Sydney Fisher for his interest in this work, and the Quebec Minister of Agriculture for allotting sufficient money to make the course possible.

During the past year there has been a revision of the text books used in our schools. There has been some criticism about the price of these, but it must be remembered that we are in an unfortunate position with reference to these books, as on account of the relatively small number of schools it would be unprofitable to issue our own editions. Whatever criticism there may have been as to the price of these books there can be none for their selection. The majority are admirable, and the needs of the rural community have been studied; thus, for example, we have an arithmetic with agricultural instead of commercial problems, and which further suggests many good practices in modern agriculture.

The interest in the sheep work of our Live Stock Department has increased during the past year, and under the guidance of Professor Barton a number of co-operative Wool Growers' Associations have been organized. The full story of these cannot be told here for want of space, but as a result of our work some of the best wool ever sold in Canada was handled by these societies in ten counties, 102,529 lbs being marketed. This wool was graded into five grades and sold in accordance with grade and quality. 50% graded either medium or fine combing and sold for 31 to 31¾ cents per pound; 27% graded low combing, 20% graded lustre and realized 30 cents, and 3% graded rejection or black and sold for 25 cents. The prevaling prices for wool not sold through the Wool Growers' association in most of the districts was 23 to 25 cents.

This transaction realized handsome profits for the wool producer, and the manufacturers obtained wool well put up and good value for their money.

School Fair work has taken up a good part of the time of our demonstrators and also the College departments closely associated with this work. The Poultry Department provided 610 sittings of hatching eggs of pure bred Plymouth Rocks for distribution by the demonstrators to the children, and breeding flocks and demonstration houses have been located at six centres in the province. The Horticulture Department provided in the same manner one thousand 10 lb lots of potatoes of approved strain, eight hundred collections of flower seeds; 350 packets of tomato seed, and in addition smaller quantities of other vegetable and flower seeds were distributed to school children in the province through the College demonstrators.

Much attention has been given to root seed production. In view of a probable scarcity of the European supply of seed in 1916 on account of the war, the Cereal Department has encouraged the extensive growing of seed in 1915; and from the results accomplished in previous years, we may state that Canadian grown seed has been shown to be superior to imported seed.

Much remains to be done to produce in Canada sufficient root seed for our own use, but we believe that the instruction we have given in this line will be productive of a good start in this direction.

The limits imposed on me by the Editor do not permit me to any more than mention the excellent work being accomplished by the 33 Homemakers' Clubs; the successful convention of 38 delegates from these Clubs held at the College on June 15th and 16th; the work of the Agricultural Engineering Department which has surveyed and mapped for drainage 4000 acres of land; the continued experimental tests of various feeds for milk production, steer, sheep and horse feeding; the distribution of 1500 bottles of nitro-culture for inoculation of alafalfa and clover seed; the investigation of many problems relating to weeds, fungous and insect pests; the work for the improvements of cereals, grasses and clover with a view to the distribution of better seed to our farmers; the investigation in connection with methods of detecting adulteration in our maple products; the important experiments of the Physics Department on the movement of water in soils and the forces which cause this movement; and the work of lecturing and teaching to our regular classes, all of which should be taken into consideration when viewing the work of Macdonald College for 1915.

But what of the future? What are our resolutions for 1916? Much of our work will be continuation of our efforts briefly outlined for the past year. Again our lecturers will conduct meetings throughout the province in the month of January; the Short Course announcement is already published.

The steady progress of research will continue in all departments, and the work of teaching will be continued with added experiences and lessons of the last season. One or two new plans may be mentioned. We want to link the rural schools to the College and we have appointed a demonstrator to visit these schools and help them in their work of teaching the new course in Nature Study and Elementary Agriculture. In conjunction with the Horticulture Department this demonstrator will prepare plans and supervise the work of planting the school grounds with trees, shrubs and perennial plants, some of which will be furnished free of charge. We want to make both the inside and outside of our schools more attractive to pupils, and a source of pride to the community they serve.

We have been asked to start a short course in dressmaking and millinery in order to give farmers' daughters an opportunity of learning something of these subjects. Also to place them in a position to use knowledge thus gained as a source of pin-money. In compliance with this request we start early in January a three month's course for these subjects and have engaged a competent instructor to aid our regular staff to make the work as practical as possible.

Macdonald College is doing its utmost to serve the rural community, but in order that the full benefit of such service as we offer can be obtained there must be co-operation and mutual helpfulness among the scattered thousands in the province and the College.

In conclusion, let me take the opportunity given me by the Editor of sending to each of the readers of the Journal hearty greetings and best wishes for the New Year. Make yourselves nests of pleasant thoughts, bright fancies, satisfied memories, noble histories, faithful sayings, treasure houses of precious and restful thoughts which care cannot disturb, nor pain make gloomy, nor poverty take away. Houses built without hands for our own souls to live in.

F. C. HARRISON.

GREETINGS FROM BROME COUNTY

The Editor,
Journal of Agriculture:

I am in receipt of your esteemed favor in which you ask me to send a New Year's greeting to your readers.

As I am only an amateur farmer, I do not feel qualified to write with the detail so necessary to make my greeting carry the full message I would like to send. If, however, you (and they) will pardon me, I would like to impress upon your readers a fact which I hope we all realize, namely, that every farmer in Canada owes it to his Country, his family and himself to increase *by every way in his power* the product of every inch of his land, and every animal under his control.

There has been a time when farmers of Canada were entitled to consult their own feelings as to the volume of crops they should raise, but since this war began, no farmer is entitled to put his hand on his heart and even pretend to himself that he has done his duty, *unless he has strained every nerve* to furnish for the Allies and the Empire every dollar's worth of product *that it is possible for him to raise.* It is not only during the continuance of this war that the farmers of Canada are going to labor under this obligation, but in the days that are coming Canada will have a volume of indebtedness which (if we are going to pay the interest on it) will still demand *increased effort on the part of every one of us.*

I am one of those who believe that when the war ends Canada will be looked upon by thousands and thousands of worthy citizens of other lands as the Mecca to which they might well move with their families and their belongings in order to avoid the burdens, and above everything the terrible chance that generations of men will dream of, namely, that they and their children and their children's children will again be obliged to experience the ordeal through which Belgium, France and other countries have suffered. When that time comes it is quite possible (and I am one of those who believe it is as sure as tomorrow's sun) that the tide of immigration which will come into Canada can be made to help us bear our National burden — but that immigration we need so badly will go to the United States, Australia and other lands, unless our politicians wake up and create the machinery necessary to attract and provide for the assimilation and location of this great band of wealth makers. It cannot be done when they have passed us, and it cannot be done in a few months. Plans must be prepared to-day.

Every one of us knows that much land has been neglected in Canada, efforts have been wasted, poor systems followed, and we have not shown that full measure of energy we should have done, but we know to-day that nothing but the maximum will save our Country, and that being the case let my New Year greeting to your readers be (no matter what Province they live in, or what nationality they belong to) to unite in the task of showing to the world what eight millions of people can do, not in the matter of spending money or borrowing money — but in the matter of earning money, and the only place that sufficient money can be obtained to achieve the desired object *is at the hands of the farmers, and from the lands with which we have been blessed.*

It does not seem necessary for me to do it, but I am specially interested in what interests the farmers of the Eastern Townships, and let me (through your Journal, not for the first time, nor yet for the last) ask the farmers of the Eastern Townships *to exert that energy, good judgment and patriotism practised by our fore-fathers,* and we will thereby encourage new men who will come to Canada to join us, and help a section of the country that has been blessed by Providence in every possible way, and that only requires to be thoroughly populated and properly farmed to be *one of the gardens of this great Dominion.*

For myself I consider it a solemn duty to take my place in the ranks with the men whom I address, as other men have taken their places in the ranks of the Armies of the Allies, and while my farm may be small and my opportunities limited, I promise you that I shall be one of those *who will go to the limit for better farming and greater National prosperity.*

I trust that you will have continued sucess in the important and splendid work your Journal is doing, and that the farmers of the Townships will take advantage of your experience and knowledge, and thereby help you to build up a Journal which will be *the envy of your competitors* and *the glory of your friends.*

Yours truly,

GEORGE G. FOSTER

"I always call a spade a spade," said the emphatic man. "That's right," replied Broncho Bob. "A fourflusher once lost his life in Crimson Gulch by callin' a spade a club."—*Washington Star.*

GREETINGS FROM THE SECRETARY OF THE CANADIAN AYRSHIRE BREEDERS' ASSOCIATION

To the Farmers of Quebec,

Greeting—

AT this the commencement of another year I trust a grateful spirit fills the hearts of our people—grateful, that our country is still free from the hand of the ruthless invader; that Britain's navy still dominates the high seas and protects the commerce of the world; that the arms of the allies are staying the ravages of the land pirates, and that indications point to our boastful enemy being in the last throes of a death struggle.

Last year Providence favored our province with a bountiful harvest, and we now enjoy a large measure of prosperity. In no province of this wide Dominion should there be a more cheerful and happy people than the farmers of the Province of Quebec. Have you thought of what a grand heritage we have in this Province? We enjoy great constitutional liberties, a favorable climate and a fertile soil, and we are near the seaports where our surplus products may be quickly loaded on to the ocean-going vessels and carried to the marts of the world. Situated in the heart of our province is Montreal, Canada's greatest city, its commercial metropolis, and with its population fast reaching the million mark. Here we have an excellent home-market where the highest prices are obtainable for products.

Then too, our herds and flocks are not inferior, but in some respects superior to those of the sister provinces, and our province will continue to be the breeding ground for certain lines of stock to supply the markets of the United States and the provinces east and west.

Our province is fast developing along agricultural lines, because we are a pastoral people and because agriculture, our chief pursuit, is being encouraged and helped as never before. Our men in high places realize that agriculture is the basis of all true prosperity and the mainstay of our institutions. Realizing this, I believe greater things could be accomplished were we to pay greater attention to *agricultural education;* the teaching of elementary agriculture in our schools. The school garden and the school fair are all a means to this end, and should be encouraged by the Department giving larger grants for this work. The county and District Fairs must be made educational as far as possible. Our Fairs should not be considered only as institutions in which a small membership and entry fee may secure a large amount in prizes, but rather as places where the best live stock and products are brought together, where comparisons can be drawn between the best and the poorest and valuable lessons can be learned. The judging competitions too have become a valuable means whereby our young men may learn to know what is best in live stock and cereal husbandry. In communities where these are held an increased interest is always evident.

To make our annual Fairs more educational requires more money than is at the disposal of the Fair Boards. Our Honorable Minister of Agriculture could double the annual grant to each Fair and I am sure splendid results would follow.

Our great agricultural institution, Macdonald College, is doing wonderful things for the development of agriculture along educational lines. The knowledge being disseminated throughout our province by its eminent professors, teachers and district representatives is already bearing fruit. Evidences of this are seen on the trail of these men, increased acreage cultivated, shorter rotation of crops, improved seed, increased yields per acre, better live stock, larger milk production and a higher plane of living on the farms. The same may be said of the other agricultural institutions, of which we have several in various parts of the province.

What is the outlook? I am optimistic, most optimistic of the future of our province. We have as yet hardly touched on the possibilities of our land. Fertile in valley and on hill, the soil only requires to be treated according to the methods advocated by our instructors and practised by our most progressive farmers to regain, to hold, and to increase its fertility. The great valleys of the St. Lawrence, Richelieu, St. Maurice, Yamaska, and other rivers posses a soil equal to any in fertility. The rolling lands of the Eastern Townships with their innumerable springs of beautiful water cannot be equalled for grazing; in fact nearly the whole province richly dowered as it is in feed and water, is particularly adapted to stock raising.

While our farmers have been rearing horses, dairy and beef cattle, sheep, swine and poultry with a large measure of success, yet greater improvement in form, type and production is possible.

The home-market for our pure-bred stock is demanding much from us, as new districts in our province are opening for better breeding stock. The markets outside our province, particularly the western provinces and the United States for our dairy cattle, we have endeavored to meet, and many carloads of choice dairy stock have gone west and south during the past few years. I anticipate that the demand from these sources will increase from year to year, and we must keep up our supply to supply the buyers that are sure to come our way.

A bigger market for our breeding stock is looming up—in Europe. When the present conflict subsides much of our live stock will be required to build up the depleted herds of that devastated land. Where will they be got? What country or countries will supply them? Quebec has the foremost place and is in the sure running to get a large part of such trade, and it behooves our stockmen to prepare for this remunerative and reconstructive business.

The greatest hindrance to the progress of our farmers is the vexatious labor problem. Recruiting and enlisting, which is necessary and right, has not helped the situation. Immigration has afforded relief in some localities, and it looks as if the bringing of men and women from the over-crowded land areas of Europe is the only solution to this serious handicap. If so, we must endeavor so to conduct our farm operations as to give the newcomers labor all the year, otherwise they will drift to the cities to enter those occupations that give steady employment. It is considered by men who know that when the war ceases there will be a large migration from European countries to Canada. Our province will get her share and our endeavor should be to welcome these people among us and to work side by side with them as our boys in "khaki" have fought with them in defence of one common cause.

Farmers of Quebec, let 1916 be the commencement of the most progressive period our province has yet realized. Let us practice the best methods of soil cultivation, pursue most progressive policy in animal and cereal husbandry, adopt the best methods of educating our boys and girls,—the best asset of any nation,—and endeavor to carry out the principles of truth and justice in our everyday life.

Only thus will our province maintain her greatness and strength and keep pace in the march of progress with the sister provinces that make up our broad Dominion, the fairest possession of Britain's world-wide Empire.

W. F. STEPHEN,

Huntingdon

EDITORIAL

"A HAPPY NEW YEAR"

THE *Journal of Agriculture* wishes its many readers *A Happy New Year.* Happiness, however, depends much upon the individual, and different persons may have very different conceptions of the term. Wealth does not always bring it, neither does health. Work is not always conducive to happiness, neither is leisure. Happiness is a state of mind produced in people with the consciousness that their efforts have been instrumental in bettering the family, the community, the country and the Empire. Selfishness plays no part in reaching this state of mind, although many persons are vainly striving to attain it by this method.

In these days of trial many of our young men and women are finding happiness in devotion to duty, in defending the Empire against the terrible assaults of a nation armed to the teeth and determined to overthrow the liberties of free peoples.

Those of us at home have plenty of opportunities for the improvement of conditions both here and in Europe. We must do our share in this struggle, and we must all pull together with a strong pull. This is not a time for self-seeking. There are also many things to be done in our own community which can only be done when all coöperate. For example, we need better schools so that the children may have a better chance of being more useful in later life. We need more coöperation in farm operations and in farm life generally so that the people on the land may become more contented and happy. We need, generally speaking, a finer sense of civic responsibility so that the community and the state may be what they should be.

Progress has its "growing pains", the troubles arising out of new adjustments. Huxley once said very truly "A heavy tax is levied on all forms of success". We cannot expect to have success without effort which is frequently attented by much travail.

"Life is not as idle ore;
But iron dug from central gloom,
And heated hot with burning fears,
And dipped in baths of hissing tears,
And battered by the shocks of doom,
To shape and use".

Even this is preferable to what many think ideal—"the universal green-grazing happiness of the herd".

In wishing our readers a Happy New Year we do not mean so much wealth and health as that consciousness of unselfish duty well performed during the year upon which we have entered.

SHORT COURSES BY MACDONALD COLLEGE

MACDONALD COLLEGE offers the following Short Courses for 1916:—

1. Lectures on Live Stock, Field Crops, Poultry, Horticulture, Farm Engineering and Farm Home at the following places in the Province: —Chapeau, Shawville, Quyon, Lachute,

Dundee Centre, Havelock, Clarenceville, Bedford, Sutton, Scotstown, Cookshire, Bishop's Crossing, Kingsbury, Ulverton, Coaticook, Waterville, Lennoxville, Ayer's Cliff.

At Chapeau,	January	3rd,	Scotstown
“ Shawville,	“	4th,	Cookshire. *
* “ Quyon,	“	5th,	Bishop's Crossing.
“ ————	“	6th,	————
“ Lachute,	“	7th,	Kingsbury. *
“ ————	“	8th,	Ulverton. *
* “ Dundee Centre,	“	10th,	Coaticook.
* “ Havelock,	“	11th,	Waterville.
“ Clarenceville,	“	12th,	Lennoxville. *
* “ Bedford,	“	13th,	Ayer's Cliff. *
“ Sutton,	“	14th,	————

At each place three members, at least, of the College staff will be present representing different lines of work. In nine places, those marked with a star, meetings for farmers' wives and daughters will be conducted by members of the staff of the School of Household Science.

2. HORTICULTURE — at Macdonald College, February 7th to 11th inclusive.
3. POULTRY — at Macdonald College, February 15th to March 4th inclusive.
4. DRESSMAKING — at Macdonald College, January 3rd to March 17th.

Applications for Courses 2, 3, or 4 should be addressed to "The Principal, Macdonald College, P. Q.

THE AGRICULTURAL AWAKENING IN QUEBEC

THERE are many indications of an awakening in agriculture in the Province of Quebec. The farmers are coming together in a spirit of co-operation and are achieving results that were deemed practically impossible a few years ago. They are responding to the efforts made to help them by the Federal and Provicial Governments and by the Colleges of Agriculture.

The reason for this changed attitude is not far to seek. Farmers are a practical class of people and demand demonstrative evidence of the value of new methods before they begin to adopt them. In bygone days when the lecture system was in vogue, only a few were influenced by the advice given out freely by speakers who often had little or no practical acquaintance with farm work or with the farm conditions of the district. But after the Demonstration idea had been started and put into concrete shape, that is, made a "going concern", the farmers sat up and took notice of what was happening. The results were convincing, in some cases even startling.

The Demonstration idea has expressed itself in many ways. It may be seen in the work of the Federal Demonstration Farm at Lennoxville, where the results are observed by thousand of farmers annually; in the Demonstration orchards and Sugar Makers' Association operated by *the Provincial Department of Agriculture;* and in the Demonstration Plots with Alfalfa, Clover, Roots, Corn and Grains, supervised by Macdonald College. It may also be seen in the Wool Growers' and Sheep Breeders' Associations, the Egg-circles and other activities organized by the District Demonstrators, all bringing home to the farmer the benefits of well-conducted co-operative societies. It may also be seen in the drainage work done by the Provincial Department of Agriculture and by Macdonald College.

The Provincial Department of Agriculture has done much in connection with this movement to raise the standard of the herds through annual auction sales of pure bred animals held at Quebec and Montreal, and the Federal Department of Agriculture, through the organization of Cow-testing Associations has aided materially in improving the dairy herds. Macdonald College, too, has been active in its efforts to increase the number of sheep in the more hilly districts which are well adapted for sheep raising. At the present time the Provincial Government is engaged in an active campaign for increased bacon production, which will no doubt be attended with success.

The dairy interests have been well looked after by the Department at Quebec, and the output of the present year has never been excelled in regard both to quality and quantity. This result may be primarily attributed to the excellent co-operative system of selling butter and cheese on the Montreal market and to the high standard attained by the makers of these products.

This awakening of agriculture in Quebec may be expressed in the words of Sir Horace Plunkett : "Better Farming; Better Business, and Better Living."

In connection with the Better Living aspect of farming mention should be made of the important work done by the Macdonald College Demonstrator for Women's Clubs. By the organization of such clubs in rural communities the women are brought together at regular intervals for discussions, the reading of papers, social intercourse and the transaction of business, that have a bearing on home and community life. New interests are being aroused and women's influence is being extended beyond the home to the school and to the community. Reforms are being effected in the equipment of the home and the school, and it looks as if Women's Clubs are to be a powerful factor in the improvement of country life where the people are happy and contented.

Quebec is maintaining her position next to Ontario as a great agricultural province, and her farmers are fortunate in having good markets close at hand. Her herds of live stock are well known from coast to coast both in Canada and the United States. In every county of the Eastern Townships may be found pure-bred herds of Ayrshires, Shorthorns, Holsteins, Jerseys, Guernseys, Swiss Browns and French Canadians, as well as fine representatives of Clydesdale, Percheron and Flemish horses. Her sheep and swine industries are likely to advance rapidly in the next few years, and her dairy industry is already well established.

It must be acknowledged, however, that the farms of Quebec are being operated far below their maximum capacity. The number of stock could easily be doubled if attention were given to the production of more feed, the hilly country could readily maintain large flocks of sheep, and the land could double its crop production under a system of proper cultivation, better drainage and the use of better seed. With the prevailing prices for farm products, however, there is every reason for believing that the revival which has set in will result in a permanent improvement in farming conditions in Quebec.

A pleasant house party at the home of Mr. and Mrs W. Greig of Cairnside, Chateauguay Co. A Dominion Day, not a Christmas Gathering.

QUEBEC'S OPPORTUNITY IN THE PRODUCTION OF PORK

WE recommend to the attention of all our readers who are in a position to raise hogs the important article by Professor Barton entitled "Market Requirements and the Profitable Production of Hogs." This article is to form part of a pamphlet issued by the Hon. J. Edward Caron, calling attention to the great opportunity which is presented to our Quebec farmers, particularly to those engaged in dairy farming, in the production of live hogs for the Montreal market.

The Montreal packing houses are capable of handling 3,000 hogs a day and Quebec farmers producing the right type of animal will realize good profits by supplying as much of the demand as possible. The packers would prefer to have their demands supplied in this province, inasmuch as the hogs arrive in Montreal in better condition than when shipped from the West and the heavy transportation charges, amounting to about one cent a pound, are saved.

It will be noted that the hogs must be marketed in good ocndition, neither too fat nor too lean and at a weight of 175 to 225 pounds. With proper feeding this weight should be attained about the age of seven months. Breeding sows of good type should not be sacrificed, but should be well developed by liberal feeding and proper care so that when mature they will be capable of producing two strong litters a year. Advice as to food and care is given in Professor Barton's article.

In comparing the relative advantages of selling live hogs and dressed pork, the farmer should remember that there is a loss of about 25 per cent in dressing a hog and also that in selling alive there is no shrinkage due to preliminary starving and that labor and fuel are saved. A price of 8 cents live weight is, therefore, equivalent to one of at least 11 cents dressed weight. The William Davies Company estimates it as equivalent to 11½ cents dressed weight.

In a circular which the Hon. Mr. Caron has already addressed to parish priests, calling their attention to the opportunities of our farmers in this direction, he states that the packing companies have assured him that they are ready to send a buyer to any place in the province of Quebec where they are notified that a carload of 50 to 60 hogs of the proper type is to be had. The opportunity is one that deserves favorable consideration on the part of our readers.

THE SHEEP AND DOG LAW

THE Hon. Mr. Caron, Minister of Agriculture, has under consideration the amendment of the Act adopted by the Legislature in 1912 providing for "the creation of a compensation fund for the benefit of the proprietors or possessors for damage done to their sheep". This Act provided:

(1) that the council of a rural, village or town municipality should, upon petition of one-fourth of the rate-payers, pass a law imposing an annual tax of one dollar upon each dog and of four dollars upon each bitch at large in the municipality;

(2) that the proceeds of the tax should be devoted to the compensation of sheep owners for damage done to their sheep by dogs;

(3) that such compensation should not exceed five dollars per sheep;

(4) that the unexpended balance of the fund should be returned to the dog-owners in the form of a rebate.

A complaint has been made to the Minister on the part of the Eastern Townships Associated Boards of Trade that this Act is not serving the purpose for which it was intended, that is to say the adequate protection of sheep owners against the ravages of dogs. In support of their claim the Associated Board of Trade have forwarded to the Minister two letters from Professor Barton of Macdonald College to Mr. C. H. Hibbard, Secretary-Treasurer of the Standridge East Board of Trade. In his letters Professor Barton maintains that the Act has four defects: (1) It is difficult to get the law adopted. The burden of securing the adoption of the law falls upon the sheep owners and it is no easy matter for the sheep owners in any municipality—and a practically impossible matter for those in some municipalities—to get up a petition signed by one-fourth of the ratepayers. (2) The law is difficult to operate when it is adopted. This point is not expounded in Prof. Barton's letters but we understand that the chief difficulty lies in the provision that the dog tax is to be collected separately and kept as a separate fund. Would it not be better to have it collected with the other taxes and do away with the rebate principle? This is a question upon which the opinion of municipal officials would be of value. (3) The rate of compensation is too low. Five dollars a head, while a fair valuation for thousands of the sheep now in the province, is a very poor compensation for the loss of a sheep of the kind the Department is trying to increase—for instance, for such sheep as are sold at the auctions of the General Breeders' Association, held under the auspices of the department, at prices of $20 to $50 a head. This limitation of the compensation of five dollars a head would operate to oppose the policy of improvement of stock to which the Department lends its hearty general support. The Hon. Mr. Caron admits that point and promises to take it up with his colleagues. (4) That the provisions of the act for restricting the field of safety for depredating dogs is inadequate. Two considerations are mentioned by Prof. Barton in support of this contention. (a) That the territory to which the law is made to apply is too limited. This weakness in the law is to our minds quite obvious. What object would there be in a rural municipality adopting the law if an adjoining town or village refused to adopt it? The Ontario act requires every municipality to adopt the law. (b) That no provision is made for the destruction of dogs. To this contention the Minister replies that the common law gives the farmer the right to kill a dog found worrying or injuring sheep anywhere. Prof. Barton, however, is not satisfied with this. He maintains that provision for the destruction of bad dogs should be incorporated in the law itself.

Previous to this correspondence the Minister had received no complaints as to the operation of the law, a fact which lends some support to his contention that sheep owners have not been as active on their own behalf as they ought to have been. They have not made serious attempts to have the present law adopted. According to Prof. Barton this is because they do not regard it as adequate. In that event they might reasonably be expected to have made representation to the Department to that effect. The columns of the Journal have always been open to the discussion of this subject. We hope our sheep breeders will no longer delay the presentation of their views individually and through their associations. The Minister is giving this question his immediate attention. Now is the time to make clear what you would consider a satisfactory law for the protection of your sheep.

THE GARDEN AND ORCHARD

THE COST OF A BARREL OF APPLES

A Correction

MR. W. T. Rexford of Granby has very courteously called attention to a mistake in the cost of a barrel of apples given on page 122 of the December 1st issue of the Journal of Agriculture. The mistake occurs in the cost of the item *Spraying. Instead of 96 cents per barrel it should be 9.6 cents.* The cost per barrel should, therefore, be 93 cents instead of $1.79. Adding 36 cents, the cost of the barrel itself, the total cost is $1.29 per barrel.

We are glad to make this correction of a mistake which is only too obvious to a practical fruit-grower.

EDITOR

ANNUAL MEETING OF THE QUEBEC POMOLOGICAL SOCIETY

Held at Macdonald College December 9th and 10th, with a fair Attendance of Visitors and a creditable Exhibition of Fruit.

THE annual winter meeting of the Quebec Pomological Society was held at Macdonald College on December 9th and 10th, the president, Mr. R. A. Rousseau of Acton Vale, being in the chair. Mr. Rousseau in opening the convention discussud the developments that were taking place in fruit growing in the province of Quebec and paid tribute to the excellence of the work done by the officers of the Pomological Society and the Department of Agriculture of Quebec.

Dr. Harrison, principal of Macdonald College, gave a short address of welcome in which he described the work done by Macdonald College and the Demonstrators in the province in the promotion of agriculture. The convention was favoured by the presence of the Hon. J. Edward Caron, Minister of Agriculture, who found time to come out from Montreal and give an address on the work of his Department in the promotion of the fruit industry. In another column will be found an extended description of the many activities of his Department in this regard.

Mr. C. Petch of Hemmingford gave an illustrated lecture on "The Fruit Insects of 1915", outlining the life histories and methods of control of the bud worm, the fruit leaf roller, the codling worm and the plum curculio. Mr. E. M. DuPorte of Macdonald College gave a very clear and interesting account of his experiments in the control of the Bud Moth, and showed by the results he obtained that where only two sprays are given in the early part of the season the most effective against the bud moth are those given before and after blossoming.

Rev. Father Leopold and Mr. J. C. Chapais, two pillars of the Pomological Society.

The Rev. Father Leopold of La Trappe discussed "Our Markets and the Inspection and Sales Act". This question brought up an interesting discussion regarding the inspection of windfalls. Last summer nearly half the apples were blown down in the September gales, and immense quantities of really first class fruit had to be sold under the Act as third class, with much loss to the grower and profit to the dealer and middleman. It was suggested that a special classification and marking for windfalls be instituted, and this matter will be taken up by the Department.

In the evening of the first day of the meeting Professor W. T. Macoun, Dominion Horticulturist, read a very interesting paper on "Horticultural work of the Dominion Experimental Farms in Quebec", outlining the work done at Ste. Anne de la Pocatière, Cap Rouge, Lennoxville, and at Spirit Lake up in the North country. Mr. R. B. White, of Ottawa, gave a very fine address on "English Gardens", illustrated by beautiful lantern slides prepared from photographs taken by himself. Professor W. Lochhead of Macdonald College also gave a short address on "Fruit Spurs".

The following afternoon Mr. J. C. Chapais read a paper on "The best Summer and Fall Apples for Eastern Quebec". Professor W. P. Fraser of

Mr. G. B. Edwards of Covey Hill, Mr. Peter Reid, Mr. Robert Brodie, Mr. Crossfield of Abbotsford and Mr. Passingham of the "Gazette".

Macdonald College read a paper on "The Cankers of Quebec Orchards". This paper brought up another valuable discussion on the prevalence of Cankers and their cause. It was shown by Professor Fraser that there are probably at least four kinds of cankers in our orchards, the Black Rot canker, the Fire blight canker, the European Apple Tree Canker, and the Bark Canker. At the conclusion of the meeting the Society moved a resolution asking the Government to provide fonds for the investigation of cankers in Quebec orchards.

Professor Bunting, of Macdonald College gave an interesting address on "The present Status and future Prospects of Orcharding in Quebec". A summary of this address will be found in another column. Mr. M. B. Davis of Ottawa gave a valuable illustrated address on "The Renovation of old Orchards in Quebec" and showed how it was possible to rejuvenate old orchards which had been neglected and to bring them into a fairly good condition again.

The convention was brought to a close in the evening by an address by Mr. B. C. Case of Sodus N. Y., on "The Future of Apple Growing" and an address by Mr. D. Johnson, Fruit Commissioner for the Dominion, on "What the Fruit Branch is endeavouring to do for the Fruit Grower". He described the work his Division is carrying on of inspecting fruit at points of shipment. The new system has given excellent results. By it the quantity of bad fruit that reaches the markets has been reduced. The boxes and barrels are examined and inspected just before they are shipped, and in cases where bad fruit is found, or over-facing is discovered, the owner of the box or barrel is prosecuted under the Inspection and Sales Act.

The system of sending inspectors and experts through the country to give the growers and packers pointers and advice along the line of packing and shipping fruit is showing excellent results. "Occasionally we have come across a few who have refused to allow our representatives to give them advice", said Mr. Johnson, "but under the Inspection and Sales Act we are able to punish those who break the law". He added that by this method the Division is able to see that the fruit leaves the shipping point honestly packed and graded.

Commissioner Johnson is pleased with the results being obtained from the system now followed of distributing information. It seems to be working almost to perfection. "We have our representatives wire us twice a week regularly, giving us information as to the condition of fruit throughout the country", he explained. "They advise us as to how the fruit is growing, what the quality of it is, and how much there is likely to be on hand at certain periods. We have our officials in consuming centres, advising us as to the condition of the markets, the quantity of fruit, and the prices being realized. All this is made up in the form of a summary report, and is sent out to the various shippers and dealers interested in the fruit business. Any shipper or grower can write or wire us and we will give him the latest information possible. In fact there are a number of the largest shippers who have asked us to keep them posted regularly as to market conditions".

"We have had to prosecute a number of shippers this year for violating the Inspection and Sales Act by overfacing their packages of fruit. Many still have the habit of piling the large fruit on top of the packages and the smaller fruit underneath. We intend to put a stop to this, and our officials have forced many packers to repack their fruit before they were allowed to sell it. The violations are not by the large and responsible growers and shippers, but by men with a small knowledge of the fruit industry, and who lack an established reputation to uphold".

ELECTION OF OFFICERS

The following officers were elected:

Patrons—Hon. Martin Burrell, Ottawa; Hon. J. E. Caron, Quebec; Hon. President, Prof. T. G. Bunting, Macdonald College; Hon. Vice-President, R. Rousseau, Acton Vale.

President — Prof. W. Lochhead, Macdonald College; Vice-President, T. A. Raymond, St. Valier; Secretary-Treasurer, Peter Reid, Chateauguay Basin.

A group of members of the Pomological Society at Abbottsford.

Directors—R. J. Marshall, Abbotsford; G. P. Hitchcock, Massawippi; George Dickson, Rectory Hill; M. Talbot, Ste. Anne de la Pocatiere; F. X. Gosselin, Ste. Famille; A. Roy, L'Ange Gardien; Rev. Father Leopold, La Trappe; Robert Brodie, Montreal.

THE PRIZE LIST

Following were the prize winners at the annual exhibition of apples:—

Best collection, 12 commercial varieties, 6 export varieties, Alexander—A. A. Johnson, Sweetsburg.

Fameuse—1, A. A. Johnson; 2, Peter Reid, Chateauguay.

Wealthy—1, John Webber, Hudson Heights; 2, A. A. Johnson; 3, A. Lalonde, Ile Perrot.

Macintosh red—1, Peter Reid; 2, A. A. Johnson.

Wolf River—A. Lalonde.

Golden Russet—1, A. A. Johnson; 2, John Webber; 3, Peter Reid.

Scott's Winter—A. A. Johnson.

Baxter—A. A. Johnson.

Peewaukee—A. A. Johnson.

Canada Red—1, John Webber; 2, A. A. Johnson; 3, G. P. Hitchcock.

Northern Spy—A. A. Johnson.

Blue Pearmain—A. A. Johnson.

Bethel—1, A. A. Johnson; 2, G. P. Hitchcock.

Any other variety—G. P. Hitchcock; 2, A. Lalonde; 3, A. A. Johnson.

Seedling—1, John Webber; 2, A. A. Johnson; 3, G. P. Hitchcock.

Barrel of Macintosh—1, A. A. Johnson; 2, J. R. Marshall.

Box of Macintosh—1, A. A. Johnson; 2, J. R. Marshall.

Barrel of Fameuse—1, J. R. Marshall; 2, A. A. Johnson.

Box of Fameuse—1, A. A. Johnson; 2, J. R. Marshall.

PROGRESS OF FRUIT GROWING IN QUEBEC

FRUIT growing in the Province of Quebec has made considerable strides during the past ten years. Owing to the fact that there are districts where no fruit growing has been attempted and where it is desired to establish this industry, and other districts where the industry already exists but where it must be improved from a purely commercial point of view, the methods of instruction necessarily vary, in accordance with the requirements. The following have been established by the Department of Agriculture.

(1) Experimental Fields, in charge of good farmers, in districts where the climate is very severe and where several attempts to establish an orchard have already failed. These farmers are supplied with the hardiest varieties, over which a close watch is kept. There are now four of these experimental fields.

(2) Fruit Stations, the object of which is to teach the farmers the proper methods for the establishment, cultivation and management of an orchard. These stations are in charge of farmers who desire to grow fruit and who pledge themselves, by contract with the department, for a period of five years, at an annual rental of twenty-five dollars, to give their whole attention, free of charge, to the scientific management of the orchard established on their land, in order to collect the greatest possible amount of useful data for the fruit growers of their district. At the end of the five-year period, the department keeps ten per cent. of trees and shrubs originating from the scions that have succeeded. It also reserves the right to purchase the fruit of the said orchards in whole or in part for experimental purposes, exhibitions and packing demonstrations at the market price.

There are now thirty-eight of these stations, situated in different parts of the province, and they cover a total area of eighty-five acres. They are equipped with pruning instruments, spraying machines and spraying solutions. There were sent to these stations, this year, 550 lbs. of lead arsenate, 185 gallons of lime-sulphur wash and 15 lbs. of sulphate of nicotine (blackleaf 40), Some of the stations are drained and all are protected from trespassers by special fences.

(3) Demonstration Orchards, for teaching scientific methods of cultivation and showing the care with which the operations should be performed in order to market only first class fruit. These orchards are supposed to serve as models for the fruit growers of each locality. There are now seven of them covering a total area of 33¼ acres.

The annual expenditure made by the department must not exceed the sum of $500, including the annual rental of twenty-five dollars an acre, cost of building fences, cost of fertilizers, spraying solutions or chemicals necessary for the making of the same, leguminous seeds, 800 lbs. of chemical fertilizers, ten tons of farmyard manure per acre, and all necessary implements for the culture and the management of the orchard.

On the other hand, the owner is bound by contract to do all the work in accordance with a special program prepared by the department and which may be summarized as follows: he must, at his own expense, spread the manure, cultivate the soil, plow under leguminous crop, prune the trees, spray at least four times during the season, thin the fruit, pick the fruit by hand and pack it—the whole in accordance with the instructions of the superintendent of demonstration orchards.

The owner is entitled to the whole crop of fruit, but the department reserves the right to purchase this crop in whole or in part at the market price. Two of these demonstration orchards are now using grading machines; one of them has a cold storage warehouse and all are equipped with automatic pumps.

The results so far obtained have been so satisfactory that fruit growing has made progress in the whole province. Not only are the farmers now establishing orchards or renovating those that they have already, but everywhere they are organizing new horticultural societies or co-operative associations in order to improve, increase and market the produce.

In all the horticultural exhibitions held this year a marked improvement could be noticed by comparison with the previous years in the appearance, grading and packing of the fruit. In order tofacilitate the destruction of insect pests, the Minister offered last year to the agricultural societies of the province the advantage of securing, at exceptionally favorable terms, the spraying material they might need.

THE GROWING OF FERNS IN THE HOME

FERNS are very desirable house plants. Their fronds are tough and leathery hence they serve admirably for decorative purposes. Probably the Boston fern (Nephrolepis) and its varieties should have first place, and they have been known to grow for several years. They will grow in a shady part of the room, but to grow good specimens it is necessary to observe the following rules:—

1. Do not pinch the tips of the fronds; cut off all fronds that are turning brown or disfigured in any way.

2. Keep all runners cut off around the rim of the pot.

3. Do not let the ferns suffer for want of water, and do not allow the water to settle in the jardiniere or other receptacle. Great care should be exercised in watering because if the fronds are kept wet, particularly the crested forms, the dampness will cause them to decay.

Propagation

To increase the stock of ferns in the home is somewhat difficult, especially those grown from spores. The Boston fern (Nephrolepis) is so highly developed in producing fronds for decorative purposes that it has lost the power to produce fertile spores. In the greenhouse the Boston fern is propagated by runners, but the only satisfactory method in the home is to divide the plants. If a fern is growing in a 7 inch or 8 inch pot it may be divided into four parts and placed in suitable pots, or when repotting takes place in spring and early summer some of the small plants growing around the old plant may be taken off and placed in small pots without disfiguring the old plant.

Another good house fern is *Pteris;* this is a good decorative plant, some of the varieties being crested and others variegated. These ferns will grow easily from spores, but as the spores are very slow in germinating this method is not recommended in the home. It is far cheaper to purchase the plants from a florist as they will grow indefinitely if given proper treatment.

Another good plant for home decoration is *Asparagus plumosus,* or what is commonly known as Asparagus Fern. Dividing plants is the easiest method of increasing the stock. To do this wash out the roots and place the divisions in a sandy soil; after the young roots are developed repot into good soil. Asparagus fern will also grow from seed if sown about March or April.

Adiantum, or Maidenhair Fern, is a most popular plant but is somewhat difficult to manage. It is also somewhat difficult to select the most beautiful varieties, as there are nearly one hundred known species. Those offered by the florist are the hardiest and most suitable for the home. Maidenhair ferns delight in plenty of heat and light and a liberal supply of water; they are evergreen, but can be treated as deciduous by judicious drying in winter, and can by this means be wintered in a lower temperature. It is advisable to dry them off gradually, leaving them dormant for about 6 weeks. When treated in this way all the fronds should be removed directly they die down. To start them in the early part of the year, shake most of the soil from the roots, divide as necessary for needed increase of stock, repot in suitable pots and place in a sunny window. Water only when approaching dryness, increasing the supply as the ferns grow.

Soil

The soil should be of a porous nature through which water will pass freely. A good turfy loam is the best for ferns, but if this cannot be obtained select some of the best garden soil, add one part leaf mould, one part sand, and a liberal allowance of cow manure, thoroughly mixed.

Potting

No disturbance of the roots should take place during the winter months; when potting is decided upon let it be done in spring or early summer. The old plants should be taken out of their pots, a portion of the old soil shaken away, the pot thoroughly cleaned and some good drainage placed in the bottom, then repot using the soil mentioned above.

Feeding

Liquid manure seems to suit ferns better than any other fertilizer, but to administer this in the home is very unpleasant. The only satisfactory way is to water the plants and then give about half a pint of diluted liquid manure. By this method very little odor is given off.

The fertilizers recommended for Begonias in our last issue are also suitable for ferns.

E. H. JONES

VEGETABLE SEED SITUATION

THE following extract of an article from a newspaper of Gothenburg, Sweden, will be of interest to growers of vegetable seeds. The article refers to the Board of Directors of the Agricultural College of Alnarp, Sweden, asking for a Government grant for the encouragement of vegetable seed growing.

"The Board points out that the war has most clearly emphasized the importance, for the country, of home production of vegetable seed. Owing to the most important vegetable seed producing countries having prohibited the export of such seed, the prices of a great number of important vegetable seeds have risen enormously. And, still worse, some seeds can hardly be obtained at any price. It is reported, from a well informed source, that vegetable seed growing in the countries engaged in the war has been largely neglected during the past summer and that for this reason further advances in prices can be expected. Reports from Germany state that the supply of seed of spinach, carrots, most kinds of cabbage, onions, cucumbers and peas is utterly small. Furthermore, Germany has prohibited the export of vegetable seeds to the end of the war. There is therefore every reason to fear that we have to face the possibility of a very serious shortage of certain vegetable seeds".

Seed Branch, Ottawa

THE FARM AND FARM CROPS

SCHOOL FAIRS IN COMPTON COUNTY

THE Rural School Fair has been productive of so much good in Ontario that it has recently been introduced into this province, and so far the outlook is encouraging. The first school fair in this county was held at the Cookshire Academy, 1914, and was so successful that it was decided not only to continue it, but to enlarge upon the work. Consequently two School Fairs were held in Compton Co. this year: one at Cookshire and the other at Scotstown.

As was the case last year, the material which included samples of oats, barley, potatoes, turnips, tomatoes, corn, flower seeds and eggs was supplied by Macdonald College, and distributed in the spring by the Demonstrator who also supplied directions to be used in connection with the above. The plots were inspected during the summer months, and the pupils encouraged and helped where assistance was found necessary. Interest on the part of the parents was also encouraged as far as time would permit, and generally speaking it was found to be time well spent.

The School Fair at Cookshire was held on Sept. 30th. while the one at Scotstown was held on Oct. 1st. Ideal weather prevailed throughout; the attendance of pupils, parents and teachers was quite large and the exhibits were in most cases exceptionally good, in fact it was frequently remarked that the exhibits of potatoes and turnips were much superior to those shown at the Sherbrooke Exhibition. Without exception, every school where material was distributed was represented and the interest displayed by the pupils and others was very satisfactory.

The past season's experience, however, has given much food for thought. If the Rural School Fair work is to prove successful, and if the pupils taking part are to receive the benefits it is possible for them to get, the earnest co-operation of the school boards, parents and teachers with the demonstrator is essential. It has been found that the influence of good teachers and intelligent parents in sympathy with the work has been of great value, and every opportunity should be given to have the people realize what school Fairs are for, and wherein their value lies, and have them encourage the children and render them any assistance that may be necessary.

Care must also be exercised in the selection of seed material. It is very essential that none but good seed be distributed. In many cases during the summer it was found that where the potatoes, oats, barley, etc. as the case may be, had proved better than the corresponding crop grown on the farm, it was the intention of the pupil's father to save the produce, and keep it for seed another year. By so doing, the crop output should be materially increased in a few years where care is taken to provide the pupils with only first class material in the first place.

While this feature of the work is not of nearly so much importance as the educational value itself, to the young pupil who plants, cares for and harvests his plot and exhibits the produce at the school fair, yet it is nevertheless an important matter and should not be overlooked.—J. H. K.

THE VALUE OF CROP ROTATION

By Prof. A. Boss, Minnesota Agric. Coll.

THE chemist tells us that the value of crop rotation lies in the consequent provision of an abundant supply of organic and mineral matter containing all of the essential elements of plant food; the physicist that it lies in the consequent betterment of the physical texture of the soil; and the bacteriologist that the value is in the more numerous forms of bacterial life found in a soil upon which the crops have been rotated. The farmer who has practiced a well balanced scheme of crop rotation tells us that the value of rotation lies in the greater net profit per acre returned each year from his land. And each one is right in his way of thinking. Larger yields invariably follow a systematic rotation, because the growth of the grass crops, including the clovers, results in an accumulation in the soil of roots, leaves and stems of plants which we call vegetable matter. The tillage of cultivated crops following the grass crops in a well planned rotation breaks down this vegetable matter more rapidly, introduces air and moisture freely and hastens fermentation or bacterial action, resulting in greater warmth in the soil. As a result, decomposition is hastened, available plant food is abundant and the chemist has reason for his statement that the soil fertility has been increased. It is the combination, however, of physical, chemical and bacteriological forces, rather than the separate effect of any one of them, that gives the results.

As is well known by most people, the elements most likely to be lacking in the soil, are nitrogen, phosphoric acid, potash and lime. To show that it would take a long period of time to deplete the normal soil of these elements, I offer the following figures taken from Snyder's Soils and Fertilizers, calling attention also to the fact that most our farm crops feed in the surface foot of the soil:—

Surface—1 Foot of Soil Contains.	Crops require annually. Lbs.	Time to exhaust elements.
Nitrogen 5,000—10,000..	25—100	50—400 yrs
Phos. Acid 1,000—9,000..	25—	40—360 yrs
Potash 3,000—18,000....	35— 60	50—514 yrs

A study of the figures indicates that most soils contain sufficient of each of the elements to last approximately 200 or more years if all were used. It is common knowledge, however, that only a small proportion of these elements becomes available at one time. Owing to improper tillage and physical condition of the soils there often is a scarcity of available elements even though a large supply of the essential elements is known to be present in the soil. On new lands the available elements are usually abundant and but little attention is paid to the needs of the growing crops. But on land that has been farmed for some time, the farmer must consider the needs of the crops and so arrange his cropping scheme and till his land as to render available for the growing plants an abundance of these elements. It is in affording a regular arrangement of crops which can be followed from year to year that crop rotation becomes especially valuable in increasing soil productivity. The matter of making such arrangements is not nearly so difficult as many suppose.

Crop rotation means simply the classification of crops according to their habits of growth and methods of cultivation, and systematic and regular change in the order of growth. Crops are classified as (1), Grain crops, including wheat, oats, barley, rye, flax or other cereals; (2) Grass and Legume crops, including the grasses, clovers and alfalfas commonly grown; and (3), the cultivated crops, including corn, potatoes, roots or any other crops requiring intertillage. The grain crops have fibrous roots, feed close to the surface and are almost entirely removed from the land in harvesting. A small amount of stubble and the roots of the plant are returned to the soil so that the amount of vegetable matter is not seriously depleted. They are therefore said to be neutral as to effect on the humus content of the soil. The grass and legume crops, through the development of leaves, crowns and tap roots, add materially to the vegetable matter of the soil and they are classed as humus builders. The cultivated crops, on account of frequent tillage of the land and rapid decomposition, rapidly reduce the amount of vegetable matter in the soil and are therefore said to be humus destroying. It is the proper combination of these three classes of crops in such manner as to provide for the food products required on the farm without depleting the natural productivity that results in increased returns from the soil.

To illustrate the value of rotation of crops, I am going to ask your attention to the results of some work in the crop rotation at University Farm, St. Anthony Park, Minnesota. On some plots of land we have been growing cultivated crops continuously since 1894. The soil on these plots is becoming devoid of vegetable matter and crop yields are low. This soil bakes easily and is hard to handle. On plots sown to mangels each year, great difficulty is experienced in getting a stand of roots, owing to attacks of fungus or parasitic organisms on the germinating seeds. On an adjoining plot where a five-year rotation is practiced, the soil is open and pliable, good stands are obtained and yields are quite satisfactory.

The true value of the rotation is shown in the yields of the crops grown under the different schemes of cropping. A comparison of the tables submitted herewith will show that rotation increases the yield of each of the three classes of crops materially.

YIELDS OF WHEAT IN CONTINUOUS CROPPING AND IN 3-AND 5-YEAR ROTATIONS COMPARED

	Continuous wheat	Continuous wheat, 6 lbs. clover	Wheat in 3-year rotation	Wheat in 5-year rotation
1900	14.5	10.8	27.3	25.6
1901	16.0	11.3	13.5	15.2
1902	17.0	15.0	18.1	25.1
1903	16.3	24.1	24.4	30.8
1904	20.8	32.5	27.3	32.0
1905	20.8	23.3	20.6	30.9
1906	14.1	15.0	13.3	22.6
1907	24.5	25.3	19.1	23.9
1908	19.1	20.0	22.4	25.0
1909	22.7	25.0	20.3	35.5
10 year average	18.58	21.13	20.63	26.66

3-year rotation, wheat, clover, corn.

5-year rotation, wheat, timothy and clover, pasture, oats, corn. Eight tons barnyard manure on oats stubble.

YIELDS OF CORN COTINUOUS CROPPING AND IN 3-AND 5-YEAR ROTATIONS COMPARED

	Continuous Corn	Corn in 3-year rotation	Corn in 5-year rotation
1900	37.5	4.26	58.
1901	13.9	——	42.8
1902	Lost	62.0	78.6
1903	23.6	54.7	85.3
1904	11.1	45.1	37.1
1905	25.1	64.1	64.4
1906	27.6	36.1	60.5
1907	23.6	35.2	52.2
1908	33.3	38.6	53.6
1909	41.6	39.2	76.1
	26.4	*46.4	60.8

Average of corn in cont. plots yrs. 1899, '04-'09, 24.5.

Average of corn in standard rotation plots, 1899, '04-09, 60.01.

*Average of 9 years only. Weights of 1901 not used.

YIELD OF HAY IN CONTINUOUS CROPPING AND IN 3-AND 5-YEAR ROTATIONS COMPARED

	Continuous tons	3-yr. M. F. Rotation clover tons	5-yr. M. F. clover and timothy tons
1901	.95	1.58	2.36
1902	1.27	2.25	1.95
1903	3.65	3.86	6.10
1904	1.05	4.26	5.77
1905	1.70	4.86	5.81
1906		1.91	2.18
1907	1.10	1.25	1.30
1908	1.55	3.24	5.01
1909			
1910		.6	1.00
Av. 10 yrs.	1 22	2.33	3.15

Wheat continuously yielded an average of 18.6 bushels per acre. Six pounds of clover sown with the grain in the spring and plowed under in the fall gave an increase of 2.5 bushels per acre or 13½ per cent. Wheat grown in a three-year rotation of wheat, clover and corn for the same years, yielded 20.6 bushels per acre, an increase over continuous cropping of 2 bushels per acre or 11 per cent.

In the five-year rotation, the yield of wheat for this period was 26.6 bushels per acre, an increase of 8 bushels per acre which is 43 per cent over the continuous cropping to wheat, and an increase of practically 30 per cent over the three-year rotation. The five-year rotation calls for eight tons of barnyard manure preceding the corn crops. The manure and the extra year in grass are doubtless responsible for the increased yields from the five-year rotation.

Corn continuously yielded during the ten years 1900—1909, 26.4 bushels per acre. In the three-year rotation of wheat, clover and corn, corn yielded 46.4 bushels, or 20.0 bushels more, an increase of 76 per cent due directly to rotation with the use of clover. During the same years in the five-year rotation, the yield was 60.8 bushels per acre or 34.4 bushels per acre more than was grown on the land continuously to corn. This is an increase of 130 per cent. The increase of the five-year over the three-year rotation was 14.4 bushels per acre or 31 per cent.

The yield of hay in the continuous cropping plan was 1.22 tons per acre as compared with 2.33 tons in a three-year rotation and 3.15 tons in the five-year rotation. This shows an increase of 1.1 tons per acre or 91 per cent in favor of the three-year rotation and 1.9 tons or 158 per cent in favor of the five-year rotation. The five-year rotation is .8 tons or 35 per cent more productive than the three-year rotation.

To make the comparison in another way, a short rotation (three years) without manure, increased the wheat yield 11 per cent, the corn yield 76 per cent and the hay yield 91 per cent. A five-year rotation in which eight tons of barnyard manure is applied once in the rotation, the increase is 43 per cent on the wheat crop, 130 per cent on the corn crop, and 158 per cent on the hay crop.

The difference between the values of the three and five-year rotations and in favor of the five-year rotation is 30 per cent on the wheat crop, 31 per cent on the corn crop and 35 per cent on the hay crop.

This seems perhaps like a mass of figures and percentages, but it indicates clearly to me that rotation of crops alone, without manure, has a marked value in increasing production. And that a combination of rotation and manures properly applied will practically double the yields of all of our crops.

Couple with this value the more even distribution of labor throughout the year, the less expensive handling of the crops, the reduction of weeds and crop pests and the possibility of producing a product of higher grade where good rotation schemes are followed and you have a suggestion of the value of crop rotation.

LIVE STOCK

LOCAL PUREBRED SHEEP SALES

When the Wool Growers' and Sheep Breeders' Associations were organized, the purchase, sale and exchange of purebred and other breeding stock were included as one phase of the work. The executive committees of the Associations decided that the holding of local auction sales provided the best means of featuring this work, consequently arrangements were made to hold four sales: one at Lachute on Sept. 18th., one at Shawville on Sept. 25th., one at Cowansville on Oct. 9th., and one at Sherbrooke on Oct. 16th. The four sales held did not by any means fully meet the requirements of the members of the eight Associations, yet they went a long way in providing a suitable avenue for the local purchase of purebred stock and also a means of disposing of much surplus stock within the Associations. The success which attended the sales this year would substantiate a further expansion of the local sales policy, and it is hoped that another year the requirements of all the Associations will be fully met.

The following is a statement of the sales including the numbers of each breed sold, total value, and average price paid per head:—

	Shorp.	Oxfords	Leic.	Hamp.	Grades	Total Val.	Av. price
Pontiac	22	9	3	0	3	556.50	15.04
Argenteuil	6	10	1	0	1	263.50	14.64
District of Bedford	3	0	8	0	5	186.75	11.67
Sherbrooke	13	4	4	6	0	385.75	14.28
	44	23	16	6	9	1,392.50	13.91

The Animal Husbandry Department of Macdonald College, with the assistance of the College Demonstrators and through Mr. MacMillan, selected the stock and supervised the general management of the sales. Selections made included consignments from the best purebred flocks in the province.

Owing to the present tendency of most breeders to increase the size of their flocks, there was a general shortage of breeding ewes offered for sale, those offered bringing good prices. Rams of the various breeds that possessed breed character, size, conformation and condition were readily purchased at remunerative figures. There was little or no demand for average stock, farmers not being willing to pay for a pedigree unless there was individuality back of it. Thirty and a half dollars for a ram and twenty-six dollars for a ewe were the highest prices paid for single individuals at these sales. One dollar per head was found sufficient to cover all expenses in connection with selling for this year. The following is a list of the breeders who consigned stock to the Associations' sales:—

SHROPSHIRES

A. F. Ward,	Lennoxville,
Jas. A. Woodward,	Lennoxville,
C. J. Woodward,	Lennoxville,
M. Ste. Marie,	Moe's River,
Robert Mitchell,	Lennoxville,
H. E. Williams,	Knowlton,
John Watson,	Lachute,
Howard Murray,	Magog,
W. I. Bishop,	Magog,
Byron Brown,	Smith's Mills,
A. Waters,	Richmond,
A.G. Spafford,	Compton,
H. H. Fuller,	Lennoxville,
J. F. Arthur,	West Brome,
F. N. Préfontaine,	South Durham,
Geo. Page,	Coaticook.

OXFORDS

F. G. Bennett,	Canterbury,
Jas. Groom,	Bury,
C. A. Lefebvre,	Bury,
J. Bain,	Lachute,
E. McOuat,	Lachute,
Alex. Doig,	Lachute,
Wm. Hay,	Lachute,
Jas. Armstrong,	Shawville,
Alf. Armstrong,	Shawville,
J. A. Armstrong,	Shawville,
Eddie Barber,	Shawville,
E. A. Camber,	Smith's Mills,
H. G. Curtis,	Smith's Mills,

LEICESTERS

Orian Mayhew,	Canterbury,
Macdonald College,	Macdonald College,
Jas. Clelland,	Lachute,
John M. Hodgins,	Shawville,
F. A. Arthur,	Cowansville,
W. C. Strong,	West Brome,
John G. Gibson,	Cowansville,
H. G. Silver,	Danville,
Snaden Bros.,	Danville,
Geo. Hodge,	Cookshire.

HAMPSHIRES

Lyster Bros.,	Kirkdale,
R. H. Libby,	Stanstead.

CHEVIOTS

W. J. Parnell,	Lennoxville,
Macdonald College,	Macdonald College.

The expansion of the local sales policy from year to year will bring direct to the purchaser possibilities for selection which can be obtained in no other way. Breeders who have stock for consignment should keep these sales in mind so that their stock will be well grown and in attractive sale condition. This year's experience would go to show that farmers are realizing more and more the importance of a good breeding sire and are not going to quibble over a few dollars provided their requirements are met by the purebred breeders. Present prices for wool and mutton make the good sire a greater necessity than ever before, consequently the associations feel justified in taking steps to do everything in their power to increase the value of the wool clip and the lamb crop.

A PROFITABLE HERD

Editor, Journal of Agriculture.—

I think probably you will be interested in a statement which I have just received from J. Oscar Couture, Val Brillant, Quebec.

From 13 cows, of which 5 were three years old or under, he received during the past twelve months a total of 71,024 pounds of milk.

Total Cash Receipts	$951.89
Cost of Feed (of which he has complete details)	$529.95
Profit above Cost of Feed	$421.94

He is, I believe, the President of the Farmers' Club there.

Your very truly,

CHAS. F. WHITLEY

In Charge of Dairy Records.
Ottawa, Nov. 25th 1915

Teacher: "Now then, all together, once more: 'Little drops of water'—and for goodness sake put a little more spirit into it!"—*Melbourne Leader.*

MARKET REQUIREMENTS AND THE PROFITABLE PRODUCTION OF HOGS

Canada's Hog Trade

The importance of Canada's hog industry may be said to date for a period of some twenty-five years. Until about 1890 Canada produced sufficient pork for her own requirements but had no appreciable surplus. From 1890 to 1900 dairying experienced rapid expansion and with the growth in dairying the hog business had a corresponding development. Consequently an outlet for Canada's surplus pork had to be found. The United States were producing enormous quantities of thick fat pork at a very low cost, because of their great supply of cheap corn, and competition with them in this field was impossible. A promising market was finally discovered in England for a special quality bacon known as "Wiltshire Bacon". This market was open to competition but competition which Canada seemed able to meet. Before this product "Wiltshire Bacon" could be supplied from Canadian hogs certain requirements were necessary. It required hogs of a certain type, weight, and finish, and in the production of these of suitable quality such factors as exercise, feeding, and thriftiness played an important part. However, it was decided to cater to this market and induce farmers to produce hogs which would fulfill its requirements, so that after Canada's local and home trade was supplied a good outlet for her extra hogs would be available. The undertaking was most successful especially in certain provinces. Suitable hogs for this trade were produced in large numbers and the quality of Canada's product was good enough to insure its acceptance. The quality gradually improved and the output rapidly increased until 1903 when it reached a value well over fifteen million dollars. The home trade of Canada, due to immigration and the development of the western country, then began to increase and took an increasing quantity of pork products. Finally the western provinces saw their own opportunity in hog production and began to supply their own needs. This trade was soon met and a big surplus provided as well and again the export trade has been called upon to take care of an increasing surplus of hogs.

The present conditions on account of the war are stimulating the export trade and Canada's part in supplying Great Britain while yet too small is more conspicuous this year than it has been for some time. Denmark is Canada's greatest competitor in the English market but a large part of Denmark's output is now going to Germany, consequently Canada should and must make a special effort to supply this trade. There need be little fear of overdoing the market because the following figures will show Canada's output can increase a great deal before it becomes a really disturbing factor.

Bacon, Hams and Pork exported by Canada to Great Britain:—

cwts.	% of Great Britain's supply.
1913 — 244,218	6.09
1914 — 244,580	5.83
1915 — 723,109	12.29

QUEBEC'S SHARE NOT LARGE ENOUGH

Unfortunately in this large return for bacon Quebec has not received her full share. Montreal is one of America's best hog markets and a big exporting centre. Quebec, therefore, has a first class market at her door and is relieved of transportation charges which other provinces have to meet. Moreover, she is a leading dairy province and with all her by-product is admirably fitted to produce the class of hog required for export trade.

True she has had a considerable local and fresh meat trade, but Quebec is in a position to market a great many more hogs than this trade requires. Besides the hog demanded by the big packing firms for export is extremely well suited to local trade, yet the following figures show that Montreal packers receive surprisingly few suitable hogs from Quebec and that the farmers of this province have been missing a splendid opportunity. What is true of the receipts of the Wm. Davies Company will apply also to the other packers.

MEMORANDUM OF HOG RECEIPTS — THE WM. DAVIES CO. LIMITED, MONTREAL.

	1913				1914				1915.		
	Jan. Feb. March	April May June	July Aug. Sept.	Oct. Nov. Dec.	Jan. Feb. March	April May June	July Aug. Sept.	Oct. Nov. Dec.	Jan. Feb. March	April May June	July Aug. Sept.
Quebec	1.99%	2.06%	5.14%	7.44%	2.84%	2.88%	13.56%	8.54%	4.27%	11.94%	22.15%
Ontario	98.01%	83.40%	94.25%	86.83%	58.11%	65.14%	60.69%	81.59%	38.80%	51.73%	40.37%
Manitoba Saskatchewan. and Alberta	....	14.54%	.61%	5.73%	39.05%	31.98%	25.75%	9.87%	56.93%	36.33%	37.48%
	100.00%	100,00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

HOGS TOO HEAVY AND TOO FAT

For a number of years Quebec farmers seemed to take great delight and satisfaction in marketing extremely large well-finished hogs. These were marketed any time after a year old, weighing three hundred pounds or more, and excessively fat. The meat from such hogs was well suited to certain local trade, but the demand was limited and for bacon curing or export trade they were entirely unsuited. The result was that as soon as the local demand was satisfied the large packers could not handle these heavy hogs for bacon trade and the farmers who had these to sell had to accept a much reduced price, in many cases a very unprofitable price. Moreover, the production of these hogs was far from being economical because the cost of producing pork increases with the age of the hog, his size, and his condition, so that in holding these hogs after they weighed 225 lbs. it cost a rapidly increasing amount to produce a pound of gain. Accordingly the farmer suffered in two ways, production and sale. The climax of the fat heavy hog was reached about five years ago when the output happened to be somewhat larger than usual and a great many farmers found themselves with these hogs on their hands because the local trade had been much overdone and there was no demand from any other place. Since that time the heavy hog has not been so popular.

There is, however, still one source of supply and this is in young sows that have had one or two litters and have then been fed for market. This practice of marketing so many young sows just when they have become useful must be strongly condemned. It is a tremendous sacrifice on the part of the farmer because these sows would be far more valuable as breeders with their second and later litters after they became mature. Besides with the present practice there are far more sows being marketed than would be the case if they were retained as long as they continued to raise good litters. This means that there is much more objectionable sow pork marketed which must be sold at a low price and this again tends to depress the market for good hogs.

Group of the best Bacon pigs, weighing 190 lbs, live weight. These are exactly the quality required.

THE WILLIAM DAVIES COMPANY, LIMITED, Montreal.

Group of pigs too heavy and fat, weighing on an average 260 pounds each, live weight. These are not desirable.

THE WILLIAM DAVIES COMPANY, LIMITED, Montreal.

HOGS TOO LIGHT AND TOO THIN

The above mentioned heavy hog situation together with the urging of packers, lecturers, and others for the production of hogs of lighter weight and carrying less fat eventually caused a large number of farmers to almost forget the heavy hog but the present situation would suggest that the pendulum had swung the other way and producers had gone to the other extreme in producing hogs too light and too thin. At any rate this is the great trouble with the bulk of Quebec hogs at present. The practice is wasteful and the packer cannot handle these hogs to any better advantage than he could the heavy ones. In many cases he cannot and will not handle them at all. But the marketing of a large number of hogs in such condition tends to depress the market for desirable hogs. The desirable hog must weigh from 175 to 225 pounds and if he reaches this weight, after being well grown on a mixed ration until about seven months old, he will satisfy the market for condition. It is, therefore, in the interest of every one to stop marketing these half grown hogs when they are too light and too thin to bring a full price per pound and only serve to hurt the market.

The following information, from the Manager of the Wm. Davies Co. Ltd., in regard to discrimination made by packers against these hogs, will serve to show the direct loss:—

"In reference to your inquiry for tangible information as to whether the Packer discriminates against cull product, we give the definite following transactions:—

On October 18th., we bought from J. H. Pinard

Group of pigs too light and thin, weighing on an average 110 pounds each. These require fattening for an additional two months.

THE WILLIAM DAVIES COMPANY, LIMITED, Montreal.

259 hogs at an average price of 9.25c per 100 lb. These hogs averaged only 131 lb. apiece. We paid on the market the same day 9.75c for 100 lb. for select hogs, averaging 175 lb. apiece. We, therefore, bought Pinard's hogs at a discount of 50c per 100 lb.

"On October 25th. we bought from this same party 178 hogs averaging 136 lb. apiece for which we paid him 9c per 100 lb. We paid on the market the same day for good hogs 9.40c to 9.50c per 100 lb.

"I might also say that these hogs are unsuitable for our trade and these two lots were only bought as an experiment, and after we had bought the second lot we advised Mr. Pinard that we would be unable to handle at any price any further quantity of hogs as light as these. Since that time we have not had any hogs from Mr. Pinard. These hogs were bought mostly from the Nicolet District and were of good breed, and would have commanded the highest price on Montreal market had they been another 50 lb. apiece heavier."

TYPE OF HOG IMPORTANT

When the heavy hogs referred to were being marketed the type of the hogs would have counted against them at any weight or in any condition. They were too short and thick, often of poor quality, with a large proportion of cheap cuts and a lot of waste. Within the last few years a great many good breeding hogs have been distributed through the province with the result that the type and quality have materially improved. Breed is not such a great factor as many are apt to think. Breeds have their peculiarities and some are better in certain respects than others, but if a proper selection is made within the breed with a view to correcting the breed defects, no difficulty will be experienced from either a market or production standpoint. Further, in crossing and grading the proper combination should be kept in mind. For instance, Yorkshire and Chester White, Yorkshire and Berkshire, Tamworth and Chester White, Tamworth and Berkshire, are all good crosses. Yorkshire and Tamworth, or Berkshire and Chester White are not so desirable. Crossing is a good practice but not necessary, because good grading work with any of the breeds will prove very satisfactory.

METHODS OF IMPROVEMENT

Realizing the situation as reviewed above and believing that the Province of Quebec has immense possibilities in pork production which have not yet been appreciated, the Minister of Agriculture, through his Department, has been working to remedy matters. He has been instrumental in distributing a large number of pure bred hogs and has given encouragement and assistance to the Swine industry in various ways. Recently after a visit to the Montreal packing houses , he called a conference of the packers, members of his own staff, and representatives of the Agricultural Colleges, with a view to arranging for an educational campaign especially in connection with short course work. The packers were not only willing but anxious to cooperate with the Minister and the College men in this movement to improve Quebec hogs. It should be said that to certain districts in the province the above criticism of hogs marketed does not apply because for sometime they have been consigning hogs, a large percentage of which have graded as "select".

The main objects to be attained in order to place the hog business of Quebec on a much better footing may be summarized as follows:—

1.—The prevailing type of hog has already shown much improvement and is capable of satisfying the market fairly well, but there is still room for progress in type improvement.

2.—The number of hogs in Quebec is increasing but there is good reason to believe many more hogs could be carried and marketed to advantage. The rank of Quebec in dairying with all the by-product available affords an ideal basis for profitable production.

3.—The great weakness at present is in the marketing of light unfinished hogs.

4.—Too many sows are marketed after having only one litter. These sows do not make first class market sows and would be more valuable as breeders with their second and succeeding litters.

5.—The practice of selling hogs alive rather than dressed is absolutely essential in securing the biggest and best market outlet.

PROFITABLE PRODUCTION

Much might be written under this heading but in this article only a few important points will be dealt with. In selecting breeding stock the most important consideration is that of obtaining good individuals. In purebreds it is important to choose typical and breedy specimens and at the same time as in the case of grade commercial stock, individuals that are vigorous and well developed for their age. The quality of bone and strength of legs is almost as important in breeding pigs as it is in horses, yet unless an animal is seriously defective it is often overlooked. Breeding stock should be given plenty of exercise and fed as much coarse cheap feed as possible, but they should be well developed and if a sow is expected to raise two litters a year — as she should after becoming mature — she will have to be liberally fed and well cared for or she will not stand the strain. The common practice of breeding sows very young when they are half grown and then selling them after they have had one litter of small inferior pigs is hurting the pig business and will never produce the best pigs.

As for the breeding season it is advisable to have young pigs arrive fairly early in the fall, September is a good month, so that they may have a good start before cold weather sets in. This will necessitate fairly early spring litters if two litters each year are counted on. Dividing the time for different litters often helps to simplify feeding and to take advantage of market.

In feeding, much depends upon the circumstances. For little pigs at weaning time there is no single grain feed to equal a good quality of wheat shorts or middlings with which might be mixed some finely ground oats and barley. Dairy by-products with skim milk first, have no equal for pigs of any age, and without skim milk for very young pigs a man is at a decided disadvantage. There is a great variety of cheap feeds that should be more fully appreciated and more widely used in pig feeding and this is particularly true in the case of breeding hogs. Such feeds as clover, roots, unmarketable potatoes, pasture, and rape, are very valuable and materially cheapen the cost of maintaining breeding hogs or producing pork. Where at all possible it will always be advisable to feed a mixture of feeds instead of limiting the ration to single feeds. There is no advantage in cooking feed unless in the case of potatoes and certain damaged feed that might not be very palatable. If the pen is cold and the weather severe in winter it may be advisable to feed warm feed. Much the same may be said about soaking dry feed before feeding. It depends upon conditions. Some feeds are better taken by the pigs if soaked and there is likely to be less waste, although very good results can be obtained by dry feeding especially where roots such as mangels, sugar beets or turnips are made use of.

If hogs are housed closely, as they are likely to be in the finishing stages and during winter, they require comfortable conditions. Clean pens with good ventilation, dry, and comfortably warm, will reduce the cost of pork and insure good health in the herd. In summer cheap portable houses may be used for litters. These require less labor in the care of the pigs, they are inexpensive, very convenient, and assist greatly in raising pigs under open air conditions. They may be used as well throughout the whole year, winter and summer, for breeding hogs, and very seldom does one find unthrifty breeding hogs when handled in this way.

H. BARTON

The war is teaching us to trust each other and to become trustworthy ourselves. We can only do this if we consider it as our first duty to our country to do our own job, whatever it is, as well as it can be done. This should be the beginning, if not the basis, of everything else. Good business means national prosperity. It is philanthropy of the highest kind. It is the best and only foundation for social reconstruction. The scamped places in our own job become the holes in the nation's armour.—*Co-operation in Agriculture.*

"The thought recurs that education, cultivated thought, can best be combined with agricultural labor, or any labor, on the principle of thorough work; that careless, half performed, slovenly work makes no place for such combination; and thorough work, again, renders sufficient the smallest quantity of ground to each man; and this, again, conforms to what must occur in a world less inclined to wars and more devoted to arts of peace than heretofore. Population must increase rapidly, more rapidly than in former times, and erelong the most valuable of all arts will be the art of deriving a comfortable subsistence from the smallest area of soil. No community whose every member possess this art, can ever be the victim of oppression in any of its form. Such community will be alike independent of crowned kings, money kings, and land kings".—*Lincoln.*

THE DAIRY

STERILIZED MILK

STERILIZATION of milk has been practiced for nearly 30 years, and although the process is far from perfect much progress has been made during that period. More than 10 years ago managers of sterilization plants started a campaign for purer milk and at present their complaints are just as numerous as ever. The farmers (the milk producers) do not see the necessity for taking any care, much less special care, when the milk has to be sterilized anyway, and it seems to be almost impossible to teach them otherwise. The micro organisms which interfere with the keeping of milk are not the dreaded pathogenic organisms. Disease bacteria succumb easily to heat, but we must guard against the bacteria which produce spores. These spores, which are formed inside the bacterial body, are extremely resistant and will under favorable conditions germinate into vigorous bacteria. Spore producing organisms which are often found in milk are the butyric acid bacteria, and bacillus sublitis and bacillus mesentericus. The spores of the last named organisms are extremely resistant.

All these bacteria will get into the milk unless proper care is taken; we find them on straw, in dust, in the soil etc. Most farmers nowadays know how and when bacteria enter the milk, and it might be considered a simple matter to produce better milk. Unfortunately, however, such is not the case. The majority of the cow stables on the farms are in a very unsanitary condition. In such surroundings the usual sanitary precautions are useless, and the milk produced is simply teeming with spore producing bacteria.

Besides improving stable conditions, it is advisable that the farmers use the well known Ulax filters for their milk. These filters will remove considerable dirt and impurities and will make the cleaning at the factory by means of the dirt separator more thorough.

Milk can be sterilized in different ways, but the higher the temperature the more complete is the sterilization of the milk. Unfortunately milk heated to a high temperature loses its natural qualities, becomes less digestible and has a disagreeable taste and odour. Thus a high temperature can only be applied for a very short period.

We distinguish between the following:—

(1) *Fractional sterilization.* Milk is heated several times to a temperature ranging from 150°F. to 212°F. and between each heating the milk is kept for 24 hours at room temperature. This allows spores which resisted the heating to develop in bacteria without spores, which are easily destroyed. This method is slow and too uncertain for commercial use on a large scale.

(2) Sterilization at a temperature of 230°F. to 260°F. in steam or water under pressure for a period of about 30 minutes. Such milk is certainly sterile, but has a very doubtful food value.

(3) The method used most generally at present is to heat the milk to 218°F. for 45 minutes. Milk treated in this way is not sure to keep for the required time.

Some factories try to correct this shortcoming by keeping the bottles for a few days at a temperature of more than 80°F. Bottles which still contain spores will spoil and can be removed.

In the sterilization process a quick cooling of the milk is of the highest importance. If milk could be cooled suddenly from 220°F. to 80°F., the taste, appearance and digestibility of the milk would improve considerably. Milk put up in tins can be handled much more easily than milk put up in bottles. Such tins can be put in an ice cold brine solution, which is out of the question when the milk is bottled.

In milk heated to such a high temperature the cream rises easily and if stirred up too much butter particles will form, which makes the milk very unappetizing. We see, therefore, numerous objecttions to a sterilization process in which the milk must be heated to a high temperature, and the remedy is right at hand. The high temperature is necessary to kill the bacterial spores. Bacterial spores are not found in the cow's udder, but have their origin in dirty stables and poor bedding. Improve stable conditions and deliver sanitary milk, and the sterilization process becomes much more simple.

J. VANDERLECK

FOOD COLOR FADS

Some interesting information about the pigments of milk and of the fats of dairy cattle

CURIOUS what notions people get about the colors of foods and how these notions affect prices! Consider the case of bread and butter. Bread made from flour milled between stones was a good cream color—surely not an unattractive color for a food. But roller mill flour was lighter in color, and it became fashionable to prefer light colored bread. It was noticed that keeping the flour a few months lightened its color. So the millers found it profitable to store their flour before putting it on the market. This tied up a considerable amount of capital. They, therefore, jumped at the suggestion of an inventor to bleach the flour by artificial means. Then the trouble began. Millers who had not taken up the bleaching processes joined with millers who had access to a supply of wheat yielding flour of light color in an endeavor to prove that the bleaching process rendered the flour unwholesome. And lawyers by the score have made money out of the controversy.

Meanwhile the same people who wanted their bread white wanted their butter yellow. In the winter when the butter was naturally light in color and a little less lovely in flavor, they remembered the rich color and the delicious flavor of the June product and not unnaturally assumed that the two were inseparable. Then the wily dairyman began to color his butter. At first he used an extract of carrots, little suspecting that the coloring matter he added was identical with that in yellow butter fat. Later when annatto was substituted for carrot extract the dairyman was again ignorantly adding the natural coloring to the butter. Nowadays coal tar dyes are the commonly used coloring agents for butter and cheese and these have no relation to the natural pigments of milk. Nevertheless, their use is permitted in butter and cheese, although it is prohibited in milk and cream.

Again, while people liked their butter yellow they objected to the same yellow color in the fat of their beef. And as Guernseys and Jerseys are prone to give beef, as well as butter, with a yellow-colored fat, the beef of these breeds was almost as much in disfavor as their cream and butter were in favor with the public.

Now, through the efforts of Professor L. S. Palmer, the chemist, and Professor C. H. Eckles, the well-known dairyman, of the Missouri Agricultural Experiment Station, the coloring matter of the milk-fat and the body-fat of the cow have been isolated and indentified and their relation to breed and feed thoroughly studied. They find that the yellow coloring matters of the fats of the cow, whether those fats be in the milk or the beef or the hide, are identical with the yellow coloring matters contained in green plants. These coloring matters are of two classes, one known as carrotenes, the other as xanthophylls. For practical purposes each of these classes of pigments may be regarded as a single substance, and we shall therefore refer to them in the singular number henceforth.

Carrotene (or carotin as it is also spelled) is identical with the yellow pigment of the carrot from which it takes its name. This carrotene is the chief pigment of yellow butter, yellow beef-fat and the yellow hide of the Jersey and Guernsey cattle. In fact it is so predominant in the fats of cattle that in his popular bulletin, Professor Palmer does not mention the minor xanthophyll pigment as a constituent of the fat. So when a cow eats green grass or fresh soiling crops she merely extracts some of the carrotene from these feeds and colors her fats therewith. The reason she cannot do the same with yellow corn is that the coloring matter in the corn is nearly all xanthophyll instead of carrotene. The reason corn silage, unless very new, will not impart a yellow color to butter is that the carrotene is destroyed in the fermentation that goes on in the silo.

It then becomes pertinent to inquire whether there are any winter feeds rich enough in carrotene to be of butter-coloring value in the ration of the dairy cow. The only feeds of this class found were carrots and hay so cured as to preserve its original green color, such as western-cured alfalfa hay. Even in Missouri Prof. Palmer is very doubtful if it would be economical to select a winter ration that would yield yellow butter. Here in Quebec it is obviously out of the question.

A point that gives comfort to the advocates of the Jersey, Guernsey and presumably also of the French Canadian cattle is that these breeds have a superior capacity for producing yellow cream and butter. The investigators concede this, though they are of the opinion that the breed difference in this respect has been over emphasized. All breeds on a carrotene-poor ration produce white cream and butter, although when first changed from a carrotene-rich to a carrotene-poor ration, the Holstein will show a more rapid drop in color than will the Jersey. This is for the reason that the Channel breeds store a certain supply of carrotene in their body-fat, which enables them to go on imparting color to their milk-fat for a considerable time after they are put on the carrotene-poor diet. The yellow color of the skin and of the ear-wax of the Jersey was found to be due also to carrotene, but this carrotene was originally derived from the feed. According to the investigators, the cows of the Channel breeds have no power of *making* carrotene. They merely excel other breeds in their capacity for extracting it from green feeds and for storing it in their bodies.

The yellow pigment of whey is not carrotene and is not affected by the diet. It is probably identical with the yellow pigment of urine.

According to another investigator the coloring matter of wheat flour is also carrotene. If this is correct, the color prized in the butter is identical with that contemned in the bread. There would appear to be no substantial reason for avoiding it in the one nor for insisting upon it in the other.

J. F. S.

"What is your name?" a Kentuckian asked a negro boy. "Well, boss," he answered, "everywhere I goes they give me a new name, but my maiden name was Moses."—*Everybody's.*

The question about killing ants comes up again. Find the nest or "hill" and punch a hole into it with a crowbar. Pour in half a pint of bisulphide of carbon and cover with a blanket. The fumes will do the rest.

POULTRY

ATTEND THE SHORT COURSE

RECOGNIZING the growing importance and the extensive development of the poultry industry in Quebec, the Poultry Department of Macdonald College is putting forth every effort to provide a good programme for the short Course to be held at the College from February 14th to March 3rd 1916. Poultry raising is receiving more attention on the part of the farmers of Quebec than ever before, since the average farmer is just beginning to appreciate the value of a well-kept farm flock. Conditions on the farms are improving gradually, though it will be some time before the Province will supply its own rquirements in eggs and dressed poultry, notwithstanding our excellent markets. At present the farmers of Ontario, Western Canada and the middle western States are supplying the consuming population of Quebec with large quantities of eggs and poultry, and by so doing are reaping the profits which our own farmers should be making. Quebec farmers, however, are beginning to realize that there are profits in poultry raising and it is expected that production will greatly increase. Efforts are being made to improve methods of marketing to enable the farmers to realize large profits, the results of which will stimulate the industry.

The Main Building, Poultry Department Macdonald College, where the Short Course in Poultry Husbandry will be held from Feb. 14th to March 3rd 1915.

The programme of the Short Course will aim to deal with the more important problems confronting the farmer and it should be of good service to those who can attend the Course. Besides the many lectures and demonstrations given by the various members of the College staff on nearly every phase of the poultry business, there will be practical work in incubation and brooding. Mr. W. A. Brown and Mr. J. H. Porter of the Poultry Division, Federal Department of Agriculture, will discuss marketing problems and Mr. George Robertson of the Poultry Division, Central Experimental Farm, will lecture on poultry breeding. A number of lectures, illustrated with lantern slides, will be given. The course will be of great value of everyone interested in poultry raising.

SELECT YOUR BREEDERS NOW

NOW is the time for farmers to give careful attention to the selection of the breeding stock for the production of vigorous chicks next season. Many farmers pay but little attention to the breeders, and others leave the matter of selection until late in the season. This is a serious mistake which often results in poor hatches and weak chicks. The flock should be gone over very carefully early in the season and all unhealthy and poorly developed birds should be removed. Constitutional vigor counts.

The influence of the male in the flock is very great and proper selection here is very important. The male should be fully matured and well developed; cockerels will usually give better results than cocks unless the cock birds are exceptionally vigorous. Medium sized birds with abundance of constitutional vigor make the best breeders. The head should give every evidence of masculinity; a bright, full eye is a good indication of the health of the bird. The body should be well filled out and carried on stout legs of medium length. In general, the male breeder should be active, a bird of quality, and full of life.

A male breeder with good type and abundance of vigor.

These desirable characteristics in the male breeder may be applied to the female breeder. Yearlings make the best breeders. Well matured and healthy pullets may be used, though many times the vigor of the flock has been affected by breeding from young pullets. Never breed from a female which has been sick.

The supreme test in the breeding of poultry is the number of strong, healthy chicks hatched in proportion to the number of eggs set. The largest proportion can only be secured through the use of good, healthy breeders.

THE PRESENT CONDITION OF THE CANADIAN EGG MARKET

FOR the first time in a number of years eggs have taken a prominent place in Canada's export trade. This is largely due to the unprecedented demand for eggs on the part of the British market and the fact that British dealers have shown a marked preference for Canadian eggs over United States eggs and a willingness to pay a distinctly higher price for them.

So great in fact has been the demand that Canadian dealers have shipped practically all of the available Canadian storage product to the Old Country. As a result there are not in Canada at the present time, sufficient eggs in storage to supply home consumption until fresh receipts in appreciable quantities begin to come in.

Quantities of eggs from the United States, however, are being imported into Canada, some in bond for export, but the larger part to take the place of the Canadian product exported. On account of the keen demand for Canadian eggs above mentioned, United States eggs can be laid down in Canada at the present time, duty paid, at several cents per dozen less than the price at which Canadian eggs are selling for export and they should be procurable by the consumers accordingly.

A pair of Light Brahmas at Macdonald College, Que.

On the other hand the Canadian market at the present time is very firm for Canadian "Specials" (new laid) the production of which is not enough in most instances to supply the demand at local country markets. This means that high prices will have to be paid in consuming centres in order to draw a portion of these supplies from local points. Producers may therefore definitely expect reasonably high prices during the period of low production for fresh gathered eggs that will grade "Specials".

The question has been raised as to whether the phenomenal demand on the part of the British market for Canadian eggs will continue. This depends entirely upon the quality of Canadian eggs exported. Canada has tremendous possibilities as an egg producing country. The poultry industry is at present but a mere fraction of what it might be. It remains, therefore, for those most interested in the development of this trade to make the best possible use of their present opportunities, and by careful supervision of the quality of Canadian eggs going forward to pave the way for an extensive and profitable export trade in the future.

POULTRY CONDITIONS IN PONTIAC COUNTY

THE great bulk of poultry products which find their way to the larger markets are produced on the farms of the Province, thus making poultry raising essentially a farm industry. The markets must rely upon the farms for the supply of eggs and poultry, but it is well known that the demand for poultry products far exceeds the supply within the Province so that enormous importations are made annually. It becomes a patent fact, therefore, that conditions on the average farm in Quebec are far from being desirable, and with this in mind the Poultry Department of Macdonald College has undertaken investigations to determine the actual conditions affecting poultry raising in the country. It is hoped that the information obtained from the survey which is being made will enable the Department to be of the greatest possible service in developing a more profitable farm poultry industry.

Pontiac county was selected as a suitable section in which to start the survey since in this county the poultry industry is comparatively well advanced and conditions are favourable for an increase in the size of the average farm flock. The Pontiac farmers, however, like many other farmers in the Province, have not obtained the results with their flocks which circumstances warrant. The soil is well adapted for poultry raising, the very best of cheap and wholesome feed is grown and in addition there is a ready market for all poultry produce. Notwithstanding this the writer has found that of 120 farms visited recently only 72 are keeping 50 or more laying hens. Practically every farmer should keep one hen for every acre of farm land.

The number of chickens raised on the farms in Pontiac is exceedingly low. Of the 120 farms visited, 64 reported over 50 chickens raised yearly and of these only 21 were raising 100 and over. To make a success of poultry raising sufficient chickens should be raised each year to replace three-quarters of the laying stock. No breeding or laying stock should be kept more than two years and only those that have laid well during the winter months of their pullet year should be maintained the second season to serve as breeders. Every farmer, therefore, should raise at least 150 to 200 chickens each year in order to be in a position to replace his discarded laying stock from year to year. This is one of the fundamental principles in successful poultry raising and should never be forgotten.

The Barred Plymouth Rock is very much in evidence on the farms in the county and from our observation this breed seems to be increasing in popularity. While the number of purebred flocks is not large, only 25 being reported, it is a very conservative estimate to say that as many more could be classed as good grades.

According to the information obtained the egg yield, though not large, is very encouraging and it is interesting to note that the better class flocks, without exception, are the better egg producers. This clearly signifies that there is something in breed and that careful selection is necessary to insure good winter egg production.

The common practice of selling the surplus cockerels in an unfinished condition should be discontinued. Of the farms visited only 21 were crate fattening, while about as many more were pen feeding their cockerels before marketing them. The difference in value between finished and unfinished market poultry is so marked, to say nothing of increased weight, that every farmer should be using the fattening crate to properly finish his poultry. By proper feeding for 2½ to 3 weeks in fattening crates, a bird weighing 4 to 5 pounds can be increased in weight by one pound, but this is of minor importance as compared with the increased value of the flesh. The difference in value between an unfattened and a pen fattened bird is about three cents per pound, and between a pen fattened and a crate fattened bird also about three cents per pound, making a difference of about six cents per pound more for crate fed birds than for chickens without any preparation whatever. Surely this marked increase in value is sufficient to warrant the practice of crate feeding.

The system of marketing dressed poultry in the Province is extremely poor, and Pontiac county is no exception to the rule. No system of grading, packing, or selling, in fact, no cooperation whatever is to be found amongst the farmers. Why not have a cooperative organization for the marketing of the dressed poultry? Cooperation when handled along business lines is no longer an experiment.

The poultry outlook in Pontiac county is encouraging and with cooperation in marketing dressed poultry, proper guidance and careful management by the farmers the poultry industry can very easily be made one of the leading branches of Pontiac agriculture.

A. G. TAYLOR,
In Charge Extension Work
Poultry Department
Macdonald College

The re-tired farmer is all right. We do not mean the lazy "sitter" in town who has "retired," but the one who has put on new tires and starts over.

FINAL RESULTS AT STORRS

THE final report of the fourth International Egg Laying Contest, held at the Storrs Agricultural Experiment Station has been received, and a brief review of the results of the contest will be of interest to all poultry keepers. There were 100 pens entered in the contest, each pen containing 10 females, and, in nearly every case, these were pullets. The breed most largely represented was the White Leghorn with 40 pens; Rhode Island Reds came next with 19 pens. White Wyandottes came third with 9 pens and Barred Rocks came next with 7 pens. Other breeds represented included White and Buff Plymouth Rocks; Buff, Silver and Columbian Wyandottes; Light Brahmas; American Dominiques; Rose Comb Brown Leghorns; Buff and Black Leghorns; Silver Campines; Light Sussex; Salmon Faverolles; White Orpingtons and Buttercups. The average egg production for the 1000 hens was 151.8 eggs each. This is a good average for this number of hens and is a very good indication of the progress that is being made in poultry breeding work. One important fact should be borne in mind, however, and that is, that the birds were kept in small pens i. e., 10 birds to a pen and poultry raisers will do well to realize that the size of the flock has much to do with egg production. It is of particular interest that an English breeder, Tom Barron, won first prize in this contest. In itself, such an achievement is nothing remarkable, but, when it is remembered that Mr. Barron has been in the front rank of the majority of the egg laying contests in this country for the past two or three years, it is clearly seen that he has done excellent work in breeding poultry for egg production and the results he has achieved have been very remarkable. In this contest, Mr. Barron's pen of White Wyandottes came first, laying 2072 eggs or an average a little over 207 eggs each. A pen of R. I. Reds from Hillview Poultry Farm, St. Albans, Vt. came second with 2039 eggs to its credit. It is rather significant that Mr. Barron came third with a pen of White Leghorns which yielded 2001 eggs. Other winners up to the tenth place are given as follows;

4th Storrs Exp. Sta., White Leghorns, 1974
5th F. M. Peasley, Cheshire Conn., 1962 (White Leghorns)
6th Edward Cam, Hoghton near Preston, Eng., White Wyandottes 1961
7th N. W. Hendryx, New Haven Conn, White Leghorns 1948
8th Windsweep Farm, Redding Ridge, Conn. 1937 (White Leghorns)
9th Chas. O. Polhemus, Newburgh N. Y., Rhode Island Reds 1919
10th A. P. Robinson, Calverton N. Y. White Leghorns 1856

EXTENSION OF CO-OPERATIVE AND POULTRY MARKETING ASSOCIATIONS IN CANADA

WHILE the activities of the Live Stock Branch of the Dominion Department of Agriculture with regard to the organization of Co-operative Egg and Poultry Marketing Associations have been largely confined to date to the Eastern Provinces of the Dominion, the need and opportunity for work of this kind in the Western Provinces have not been overlooked.

From the fact that co-operative marketing of poultry products was something entirely new, it was thought advisable to thoroughly test out the practicability of the system before extending it to a wider area. Satisfactory results having been obtained in the East arrangements are now being made to extend the work to the Western Provinces.

The new field to be organized will receive the benefit of the experience of men who have been associated with the co-operative work since its inception. Mr. T. A. Benson, who for the past three years has been in charge of the co-operative organization in Prince Edward Island is being transferred to the Province of Alberta to fill a position similar to that which he has held in Prince Edward Island.

Mr. J. H. Hare, who has had an extensive experience in this work, not only with the Ontario Provincial Department of Agriculture, but also during the last two years with the commercial and marketing end of the work undertaken by the Live Stock Branch, has been given general supervision of the Egg Circle work being conducted by the Branch. Mr. Hare is now in the Western Provinces and will devote the greater part of his time for the next year to directing operations there. For the present he will confine his activities principally to the Province of Saskatchewan.

Mr. R. J. Allen, B.S.A. has been appointed to take immediate charge of the organization of co-operative Egg and Poultry Marketing Associations in Manitoba. Mr. Allen has had an extensive experience not only in Departmental work but also in the commercial field and goes to Manitoba well fitted to carry on this work effectively.

Mr. Wm. Kerr, B.S.A. who was in district representative work in Ontario for some time previous to joining the staff of the Live Stock Branch, and who has been associated with Mr. Benson in Prince Edward Island during the past summer, is now in charge of the work in that province. Both during his college course and later, during active work in the field Mr. Kerr has made a special study of the theory and practice of the co-operative marketing of farm products. He enters the work in Prince Edward Island, therefore, well equipped to take up the problems that have developed in connection with the advanced nature of the work at that point.

"The school house with its grounds is a very true index of the general public and intelligence of the school section. Being the common centre of habitation for a large portion of the day of that part of every family naturally drawing forth the deepest emotions of affection and interest, the character of the school house and its environment must substantially reflect the sentiment of the community. Here we should expect to see the accumulation of efforts constantly made from year to year, embellishing grounds at first selected for their convenience, salubrity and beauty of position, and adding to the useful apparatus and general equipment of the school room, originally constructed with a view to healthy physical, intellectual and moral development".

"There was a child went forth every day;
And the first object he look'd upon, that object he became;
And that object became part of him for the day, or a certain part of the day, or for many years, or stretching cycles of years.
The early lilacs became part of this child,
And grass, and white and red morning-glories, and white and red clover, and the song of the phoebe-bird,
And the third-month lambs, and the sow's pink-faint litter, and the mare's foal, and the cow's calf,
And the noisy brood of the barn-yard, or by the mire of the pond-side,
And the fish suspending themselves so curiously below there—and the beautiful curious liquid,
And the water-plants with their graceful flat heads—all became part of him".—*Whitman.*

The teacher was holding up a picture of a zebra. "Now, children, what is this?" "It looks to me like a horse in a bathing suit," answered little Arthur. —*Harper's Magazine.*

WOMAN'S WORLD

A SHORT COURSE IN DRESSMAKING

The School of Household Science, Macdonald College, giving a new course from January to March

A special course in dressmaking will be given by the School of Household Science, Macdonald College, from January 3rd to March 17th, 1916. This is a new course and one which has not been given before. However, there have been so many requests made for such a course that the School, hoping to fill a long felt want, has decided to offer it this year.

The greater part of the time will be devoted to dressmaking, but along with this will be given classes in laundry, with particular attention to dry cleaning and renovating; textiles also will be taught, emphasizing the need for careful buying of materials and clothing. One period a week will be devoted to home decoration, with some attention to color and design in dress.

In addition to this each student will have the privilege of electing one of the following subjects: Cooking, dairying, poultry, or home gardening.

The course aims to give the student a thorough training in these subjects, which later may be used as a means of earning an income. It will not only teach how to make a dress, but, by the study of textiles, will train the student to buy intelligently, and so make the most of the money at her disposal. A study of color and design will give an idea how to choose colors and patterns suitable to the individual, and thus teach the art of good dressing.

In offering this course the School hopes to meet and satisfy the demands of those who are desirous of having a better idea of dressmaking, and with a special teacher in charge of the work, promises a very enjoyable as well as beneficial term. A limited number will be taken in the class, so those who decide to take the course should send in their applications at as early a date as possible.

To the daughters of farmers of the Province of Quebec the course is free; to others the regular fees will be in order. For particulars in regard to the course, etc., apply to The Registrar, MacDonald College, P. Q.

November 9, 1915.

FOODS AND FOOD PREPARATION

Lesson XXII

Flour Mixtures, (Continued)

PASTRY.—PIE MAKING

THE last decade has done much to remove pies from the daily bill of fare and in their place are found delicate puddings and seasonable fruits. However, pastry cannot easily be excluded from the menu of the Canadian or New Englander. Who can dream of a Thanksgiving dinner without a pie!

If pastry is to be served have it of the *best*—light, flaky and tender.

Kinds of Pastry:—

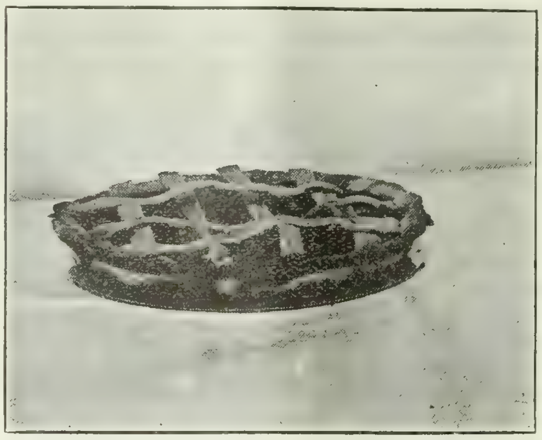
1. Plain.
2. Flaky.
3. Puff.

In Plain Pastry the proportion of flour to shortening is usually 4 to 1, by measure, and all the shortening is cut or rubbed into the flour. Sufficient ice water is then added to make a *stiff* dough. The proportion of 3 to 1 may be used.

In Puff Paste the proportion of flour to shortening is 1 to 1, by *weight*, and the shortening is worked into the flour paste by a process of folding and rolling.

Flaky Pastry is a combination of the above methods. Part of the shortening may be worked into the paste and part of it may be folded and rolled in. The proportion of flour to shortening is usually 3 to 1.

Note: ¼ teaspoon of salt is allowed to every cup of flour.



The festive cranberry tart. To top off a big dinner.

Pastry dough is a stiff dough.

Rules for Making Pastry

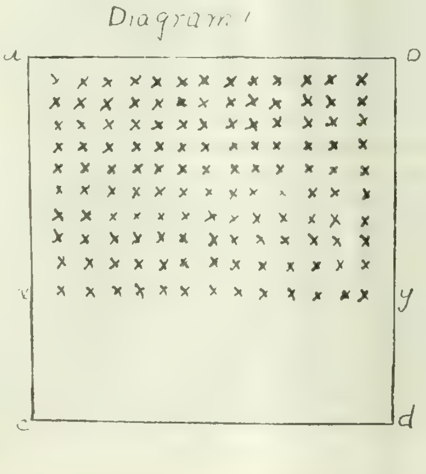
1. Everything must be at a low temperature—ice water, hard, cold fat, etc.
2. The flour used should be a fine, soft, starchy flour.
3. The best shortening is a mixture of lard and butter. Either, however, may be used alone. Clarified pork drippings may be substituted for lard or butter. Ko-ko-but may be used but not in combination with animal fats.
4. It is better to use knives for mixing in the shortening, add the water gradually.
5. Use as little flour as possible in finishing.
6. Cook pastry in a hot oven, having paste thoroughly chilled beforehand.
7. Never turn pastry over while rolling and roll in one direction if possible.
8. Touch pastry lightly.

Rules for Making Plain Pastry

Same method is employed as in baking powder biscuit mixtures. Avoid making a *soft* dough as for biscuits. If flour has to be added the pastry will be tough.

Rules for Making Flaky Pastry

Use as shortening half lard and half butter. Mix salt and flour. Cut this into the lard, using two steel knives. When granular, place knife in centre of bowl and, using ice water and working from centre, make a *stiff ball of dough.* Drop on to a very sparingly dredged board and turn over once with a spatula. Dredge rolling pin, pat dough, then roll out into rectangular shape ⅛ inch thick, having all angles right angles. With paring knife place one-half the butter in little dots over two-thirds of the surface as in Diagram 1. Fold so as to form three layers bringing *cd* up before *ab* is folded over. The paste will then be the shape of Diagram 2. Press firmly with rolling pin the open ends and open side to enclose safely the imprisoned air. Fold again so as to form three layers, bringing *ac* over first and then *bd* over in line with the folded edge, as in Diagram 3. Enclose air on open ends and open side. Take care to do this securely. Chill for 15 minutes. Then press the paste lightly and evenly over its surface, so as to flatten it out considerably. Then roll out again in rectangular shape as in Diagram 1, placing the remaining butter in little dots over two-thirds of the surface. Fold in three layers as before and enclose air (See Diagram 2). Fold again in three (See Diagram 3). Enclose air as before. Chill for 15 minutes. Pat well and then roll out in desired shape. Chill paste again before cooking. Pies with one crust should if possible have crust cooked before filling is put in. In such cases paste is fitted carefully on upturned tin and, with a fork, perforations are made in the paste all over its surface for the escape of air.



N. B.—Pastry is better if made a day or so before it is to be used. In cold weather it will keep for weeks. Do it up tightly in oiled paper and keep in closed container in cold place.

Rules for Making Puff Paste

A. Proportions.

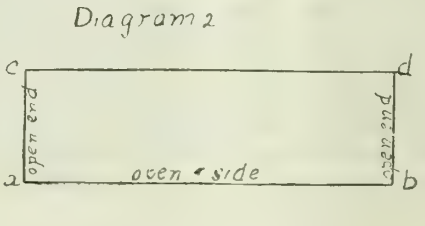
Equal *weights* of shortening and flour.
1 cup flour.
½ cup butter.
¼ teaspoon salt.
Ice water sufficient to make stiff dough.

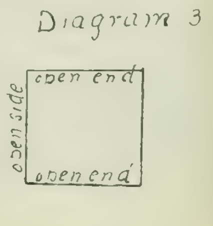
B. Method.

1. Wash butter, until waxy, in ice water, first scalding bowl in hot water.

Shell properly baked on upturned tin.

2. Pat butter in a towel to remove moisture, and form into a flat piece, reserving 1 tablespoon.
3. Work 1 tablespoon butter into the flour with spatula and moisten all to a stiff dough with ice water.
4. Knead dough on board until smooth. Roll in a clean towel or napkin and chill 10 minutes.
5. Pat and roll out ¼ inch thick in form of rectangle with corners well formed. Place butter in centre of lower half of paste, fold over on it the upper half of paste and press edges firmly together with rolling pin. Fold right edge of paste over en-





closed butter and left edge under butter. Turn paste round half way. Cover and chill 5 minutes.

6. Pat and roll ¼ inch thick in position it had last on board, having paste rectangular, lifting often to prevent sticking.

7. Fold from ends to centre, making three layers. Chill 5 minutes.

8. Repeat 7. Turn half-way round before rolling. Chill 5 minutes. This is the third folding. Three more are necessary, making six in all. After the last folding:—

9. Double the paste, making four layers, chill.

C. Chilling.

Use two pans of crushed ice — paste between them well covered.

Note: The thorough chilling prevents the butter softening and squeezing through the paste. Do not touch paste, therefore, after folding, until it is hard.

D. Baking.

Hot oven. Put three layers of papers on bottom of pan. Great care must be taken to prevent bottom of paste burning.

Digestibility of Pastry

In pastry the starch grains are coated with fat and, in consequence, there can be no starch digestion in the mouth. As the fats and starch are not acted upon by the gastric juice in the stomach the intestines are left the whole burden of digestion, which is a tax on the intestines. Hence, pastry digestion is very slow and requires a great deal of energy to render the food available for the body's use. Soggy pastry is not worthy of being classed as "food".

Dietetic Value

For people of vigorous digestion and out-door workers pastry is a suitable food. It lends variety in desserts and can be served in very many ways. It is unwise to combine fresh fruits with pastry. In hot weather or when fruit is cheap and plentiful serve the fruit as the dessert.

Apple Pie

Apple pies may be deep or have two crusts. For the latter, plain pastry will do for the lower crust. It should be rolled out very thinly and be large enough to allow paste to fall over the edges of plate all around. For one large deep pie one cup of sugar is required for tart apples. Cut apple thinly and pile in lined pie plate, sprinkling sugar between the layers. Fill plate well, especially high around the sides and then in centre leave a small space for escape of steam. When plate is filled place dots of butter over the surface and if apples are flavorless add a few drops of lemon juice and a little grated nutmeg. Brush pastry rim with cold water. Place upper crust of flaky pastry (rolled thicker than lower crust) loosely over pie, allowing paste to hang over as the lower one. With a fork dipped in flour press lightly together the two crusts all around edge of pie. Make a slit in centre and four fork holes in the surface of upper paste to allow for escape of steam. Trim pie, holding knife at angle shown in illustration (about 45°).

Pumpkin Pie "As my mother used to make".

Apple Pie—deep

Fill dish as above ready for top covering. Then brush rim of dish with water and cover it with a pastry rim closely, using paste about ½ inch wide. Then brush pastry rim with water and loosely place upper crust, preferably of flaky pastry. Make a slit in centre and pierce in four places with a fork.

Apple pies should be baked from 25 to 30 minutes. Have apple very tender.

Pumpkin Pie

Use thin plain paste or thin flaky pastry to line deep pie tin. Apply a fluted ½ inch pastry border to rim of pie to build it up.

Filling for Pie (A Dunham recipe.)

3 cups milk.
1⅛ cups *dry*, smooth, lumpless pumpkin.
2-3 cup maple or dark brown sugar.
1 tablespoon molasses.
1 egg.
¾ teaspoon cinnamon.
¾ teaspoon ginger.
A very little grated nutmeg.
A pinch of salt.

Method: Cook the pared, sliced pumpkin in water to cover in an iron pot slowly for hours and from time to time draw the pumpkin up in a pile on itself away from the bottom of the kettle and the water in which it is cooking. Let it cook very slowly at the last until all the water is evaporated and the pulp is as dry as it is possible to get it. This is the only way to have pumpkin pies at their best.

When pulp is dry add milk gradually, stirring all the time over slow heat, and, as it thickens, stir in the sugar, salt, molasses, spices and beaten egg. Always taste mixture as it is possible more sugar, etc., might be required. Cool mixture and pour in lined plate and cook in a very slow oven. A deep pie should require 1¼ hours. Slow cooking is essential for the best result. A pumpkin pie should be very dark in color and have a glossy, perfectly smooth surface with no breaks or indication of roughness.

Lemon Pie — Flaky Pastry.

Note: Cook pumpkin in uncovered pot. So much trouble and time later on can be saved if the pumpkin pulp is prepared beforehand.

Lemon Pie—

Filling for Pie.
1 cup boiling water.
1 cup sugar.
3 tablespoons cornstarch.
2 egg yolks.
1 tablespoon butter.
4 tablespoon lemon juice.

Method: Cook flaky pastry one-eight of an inch thick, on inverted pie plate, being careful to fit it well. Leave ¼ inch to turn under pastry for a rim. Prick surface all over with a fork. Bake in hot oven for from 20 to 25 minutes. Be careful that paste is cooked on under side before removing it to cooler. Turn once during baking.

While paste is baking prepare filling. Boil the water and add a few thin lemon parings. Cover and steep a few minutes. Mix cornstarch, sugar and salt well. Add strained boiled water, stirring constantly. Cook to remove all trace of raw starch. Add butter and pour into beaten yolks, stirring constantly. Cool somewhat and add lemon juice. When shell is cool add the cooled filling. Make a meringue of the whites and place over pie in points or lightly spread over surface. Bake in moderate oven until of a light golden colour.

Serve lemon pies while fresh and if pie is cold *never place on table until it has been placed in oven to crisp and lighten the cold pastry.*

Cranberry Pie—

Line pie plate with flaky pastry, applying a fluted rim. Fill with cool stewed and then sweetened cranberries. Roll out a strip of paste thinly, cut it in strips about ½ inch wide and place these across the pie half an inch apart, then interlace strip across and red diamonds fellowship with white as a result. Bake carefully so as not to develop a brown on the pastry.

There is nothing like a tart pie to top off a *big dinner* and this one is very attractive.

Mince Pie—

Line pie plate with thin paste and cover with a thicker paste, using flaky pastry or puff. The following mince meat recipe is a good one:—

3 lbs. meat.
5 lbs. apples.
3 lbs. raisins.
2 lbs. currants.
2 lbs. suet.
1 oz. ground cinnamon.
1 oz. mixed spices.
1 quart cider.
½ pint brandy.
1 lb. citron or peel.
Salt to taste.
Use the stock meat cooks in.

Method: Cook meat until tender. Season to taste, add chopped suet, spices, fruit, cider and brandy. Bottle and keep in cold place.

E. B. RUTTER

Said a scientific investigator :

"I am constantly confronted with the fact that I do not know well enough what I know to rightly comprehend what I may further know".

This is an experience that all men, scientists or not, have to contend with. There is an imperative necessity that we learn what we learn thoroughly and truly, in order that we may take the next steps in knowledge, for all truths are correlated. One fact is built upon another. What a chance there is for the farmer to establish solidly and accurately the ways of knowledge. No other man is surrounded with the deepest as well as highest truths of nature as he is.

"My hair is falling out," complained the thin man to the druggist. "Can't you recommend something to keep it in?"

"Certainly," replied the druggist, "I'd advise you to get an empty box."

OF GENERAL INTEREST

FARMING FOR WOMEN AS A LIVELIHOOD

Interesting Suggestion from Daughter of the late Sir John Carling, Minister of Agriculture 1885-1892

THERE have been many arguments for and against women taking up farming as a means of livelihood, but it may become, before long, a necessity, and it is well to be prepared for it by encouraging more young women to attend our agricultural colleges.

These who have already entered the agricultural lists, I am told, head their classes at some of our colleges.

General farming, in the majority of cases, might not be a success owing to the necessity of hiring men as laborers, but what is called "small farming", such as bee-keeping, poultry-raising, market gardening and culture of small fruits, melons and apples should be remunerative if undertaken by thrifty women.

The culture of grapes of the hardier kinds for unfermented grape juice, and as a help, and perhaps cure for many anaemic people, should be profitable.

PRODUCE NEAR MARKET

I should suggest that three women, all agricultural college graduates, with a little money, buy or lease a few acres of land near some summer resort and not far from a city, within reach of railways and street cars. If they could afford to have a motor which could in some way be utilized for carrying the produce to market, so much the better. I should emphasize that educated and intelligent women only with plenty of initiative, should begin this industry, otherwise failure would probably follow and discouragement to others.

All professions and all trades require thorough education in the special work undertaken, so why should even small farming be attempted carelessly.

Some years ago the Dominion government appointed a committee to inquire into the causes of the failure to make general farming a success in a country where so much was in its favor. The report was that it was not owing to climatic conditions or any other cause, but simply to the haphazard and faulty methods used. So much time and money were wasted by not knowing exactly how to go about the work.

When we consider that half the population of this country is agricultural, that the total value of farm products of all kinds, consumed and exported, brings a greater revenue than any of the other important natural resources, viz., fisheries, forests and mines, surely it is time to wake up and think what farming in this country will mean in a few years and what part women will take in its advancement. Our land is "flowing with milk and honey" only waiting to be tilled.

Before war was declared there were in Canada eight hundred and eighty-six women to every thousand men. We dare not think what it may be after the war.

FOR HOMELESS EDUCATED

Many homeless women of education will come to our country with perhaps a little money to invest and a will to work. If farm life can be made attractive and with a possibility of making a livelihood out of it, I think many, especially Belgian and English women, could be encouraged to buy land and cultivate it. The pioneers in the work should aim to make the farm home as attractive, simple and refined as possible, spotlessly clean, fresh, well aired and bringing science to bear upon having the work well done without unnecessary labor.

In Australia homestead grants are given by the government to unmarried women in some of the farming districts, consequently the tide of emigration of women is directed to Australia rather than Canada. Why not in Canada also?

The Maritime provinces, Ontario and Quebec and British Columbia, I am told, would be better for women's work than the western provinces, the climate being more suitable for fruit growing.

A great drawback to small fruit growing in the past has been the difficulty in having berries picked.

THE WAY OUT

Mrs. L. A. Hamilton, of Toronto, has solved the difficulty on her own farm by converting one of the farm buildings into a temporary women's hostel, which she manages herself. She visits the large department stores and offices and asks any of the women employed who would care to have an inexpensive holiday and who are willing to pick berries to come to her hostel, paying her three dollars a week each for board and they receiving a specified price for each quart of berries picked. Her scheme has worked like a charm. The young women have a cheap and pleasant outing, the berries are picked and Mrs. Hamilton makes it pay.

Dairy farms managed by competent women for supplying milk for children and invalids, especially near summer resorts, should be remunerative. The agricultural colleges would give great opportunities for learning how to choose the best cattle and the newest and most approved manner of man-

L. M. CARLING

SUCCESSFUL SHORT COURSES

THE short courses in agriculture and home economics which are being given in the French-speaking districts of the province are meeting with marked success. These courses were instituted by the Hon. Mr. Caron for the benefit of those farmers and farmers' sons, wives and daughters who have not had the advantage of a college course. One week of lectures and demonstrations is given at each centre,—sufficient time to impart a considerable amount of information, as well as to inspire a desire for further instruction. At St. Romuald, Levis County, special days were devoted to the instruction of pupils of the academy and convent. Thirteen persons passed an examination on the work of the course, and were awarded certificates. At Trois-Pistoles in Temiscouata, the attendance during the week totalled about 1700 and as a direct result of the course a cow testing centre was established. At St. Agapit in Lotbiniere the daily attendance of men and women was 180 to 250. Over one thousand pamphlets were distributed. A cow testing centre was formed with twenty members. Certificates were granted to 31 farmers and to 10 young women.

We congratulate our French-speaking compatriots on their appreciation of the benefits of these courses.

THE WORK OF THE PROVINCIAL DEMONSTRATORS

WE have received from Quebec some notes on the work accomplished by the District Demonstrators of the provincial Department of Agriculture, which may be of interest to our readers.

Mr. R. A. Rousseau, B.S.A., demonstrator in the district of Bagot and Drummond has given instruction in the fattening of poultry and the preparation of poultry for market, in the winter protection of orchards and in the rejuvenation of meadows.

Mr. Abel Raymond, B.S.A., in Dorchester and Bellechasse, held school fairs at Armagh and St. Valier at which horticultural products were exhibited as well as chickens hatched by the scholars from eggs furnished by the Department. He also encouraged the practice of crate-fattening of poultry. One poultry farm in the district actually fattened over 300 birds by this system. The co-operative societies of Dorchester and St. Justine have arranged to buy and sell in common, each society nevertheless retaining full charge of its own affairs. Mr. Raymond also reports a case of a farmer who has obtained four litters of pigs (48 pigs) from a Yorkshire-Chester-White sow in two years, and suggests that this commendable practice of breeding mature sows twice a year should be more general. The farmer in question had disposed of three of the litters for $370 and valued the fourth at $70 at the time of the demonstrator's conversation with him.

From Portneuf and Champlain, Mr. J. C. Magnan B.S.A. reports successful school fair work.

In Rouville and Iberville Mr. Henri Cloutier B.S.A. has devoted attention to the packing and classification of apples at the co-operative fruit station at Rougemont. In Quebec and Montmorency Mr. Alph. Désilets B.S.A. has given demonstrations in the wintering of bees and has conducted school fairs and a ploughing match.

Mr. J. M. Leclair, B.S.A., has been studying the soils in his district, Abbitibi, so that settlers may be informed as to their qualities.

Even this meagre sketch of the work of the Provincial Demonstrators is sufficient to indicate that they are working along lines similar to those followed by the Macdonald College demonstrators among the English-speaking farmers of the province. The problems of the two are naturally very similar. It is gratifying to know that the efforts of the demonstrators are appreciated by the farmers amongst whom they are working.

THE CHILDREN'S HOMER — II

The Adventures of Odysseus—V

FORTUNATELY, after our escape from the terrible Cyclops, we came in safety to the island of Aeolos, king of the Winds. He received us most kindly, and when we had rested and recovered our strength, Aeolos tied up all the winds save the West, in a bag, which he gave to me, bidding me guard it carefully, that I might now at last come safe to my home. Now I did not tell my men what was in the bag, but watched it myself, fool that I was, so that they thought it held some treasure that I would not share with them.

When at length the ship came in sight of Ithaca, I was so tired with watching that I fell asleep in spite of myself, and my greedy men seized and opened the bag. Out rushed the winds and blew my poor ships far out upon the sea.

We made our way to Aeolos again, but he was angry, and would have nothing more to do with us. Wearily my men bent again to their oars, and we started off, we knew not whither. We were storm-driven to the land of the Laestrygonians, eaters of men, and, by chance I, in my ship, had to anchor outside the narrow harbor, but the eleven other ships entered, and were caught there, and all the men were slain by the cruel inhabitants of that land.

In my one remaining ship, I fled away, and came to a fair island, where we rested on the shore two days. Then I divided my ship's company into two groups, of which one was to be led by Eurylochos, the other by me. From a high place on the shore I had seen a palace in the interior of the island, and I sent Eurylochos and his men to see who dwelt there.

It was not long before Eurylochos came hurrying back alone, with horror in his face. At the palace a stately woman had opened at their call, and most graciously bidden them to enter. His comrades had gone in eagerly, but Eurylochos, for some reason, not trusting the stately lady, had hidden himself behind a pillar, whence he had seen how the lady had generously feasted the hungry men and given them rich wine to drink, but then, when they had drunk, she had struck them, one by one, with the golden staff in her hand, and every man had become a wild beast, boar, wolf, or ape.

This was terrible news to me, and I started at once to the rescue of my men, though Eurylochos pleaded with me, that I should only fall under the same dreadful enchantment. As I made haste toward the palace, I met Hermes of the winged sandals, the swift messenger of the gods, sent to save me. He told me that the wicked enchantress was the goddess Circe, and he gave me a little white flower, of wonderful magic, which would protect me from her charms.

Circe met me at the door, and treated me as she had my men, but when she touched me with her wand, smiling cruelly, I smiled, too, and she was struck with terror when she saw that her magic was of no avail against me. Thus I made her set my comrades free from her spell, and we rested a year in that island.

Circe foretold to me much of the future, warning me how to shun the Sirens and escape the dreadful twin rocks of Scylla and Charybdis. She bade me spare the sacred oxen of the Sun, if we should land on their island. And she told me how I must journey alone to Hades, the land of the dead.

It happened as Circe had foretold. I left my men to wait for me and went apart to make a sacrifice. The spirit of Tiresias, Theban bard, came and guided me down to those mysterious regions, across the black river of the underworld, the Styx, in the boat which is forever rowed by the old boatman, Charon. I saw in that unhappy land of shadows many whom I had known on earth, Achilles, Ajax, Agamemnon, even my own mother, and others of whom I had often heard.

(Odysseus then related to the Phaeacians all that he saw in Hades, but it would take too long for us to hear it all).

Following Circe's advice, I stuffed the ears of my men with wax, as we drew near the land of the Sirens, the lovely maidens who sit on the shore and sing strange songs, that lure men to their destruction on the rocks. I made my men tie me fast to the mast, and so, although, when I heard the sirens calling me to come, I wanted to go, my men could not hear them nor me, and would not set me loose. Thus we passed in safety from that dangerous place.

We came safe, too, through the pass between the fearful rocks of Scylla and Charybdis, though the dreadful beast Scylla seized six of my best men, and I could not save them. That was the saddest sight of all my wanderings.

We anchored then, at the island where the sacred oxen of the Sun are pastured, and I told my men of Circe's warning, that if we should slay one of them, evil would surely come of it. And while our own food lasted, they obeyed me, but afterwards, when they were hungry, and I slept, they slew and ate, and scarcely had our ship set sail from there, when the lightning-bolt of Zeus struck, and my men perished miserably. I myself was driven back with the wreckage of the ship, between Scylla and Charybdis. I escaped by seizing the branch of an overhanging tree, as the whirlpool bore me up, and clinging there until a piece of the ship came up on the next high wave. I dropped upon that and was flung past the rocks out into the ocean.

I was washed ashore at length on the island of the nymph Calypso, and she rescued and nursed me back to health, and kept me captive all these years. The rest of my tale you know."

In the next and last number we shall see what befell Odysseus, when he left the land of the Paeacians.

MARGARET GRAY

STANDARDIZING CANADIAN EGGS

FROM present indications it would appear that one of the most important developments to date in the improvement of the Canadian Egg Trade was the action taken by the Canadian Produce Association last winter in adopting definite standards for Canadian Eggs.

Hitherto each market and in most markets each dealer had a system of grading peculiar to his own trade. This resulted in endless confusion to the consumer and great difficulty was experienced at times on the part of the producer in finding a satisfactory market for his product.

Realizing the importance of having definite standards for all live stock products the Live Stock Branch of the Dominion Department of Agriculture has endeavoured by means of pamphlets, placards, and other means to give the standards for eggs as much publicity as possible. The co-operation of exhibition associations has also been secured, prominent among which has been that of the Canadian National Exhibition Association at whose exhibition in Toronto this year in response to prizes offered, probably the largest collection of eggs ever brought together in one exhibition of the American Continent was displayed. Some 7,000 dozen in all were on exhibition. The prize list for eggs was prepared in accordance with the standards and the judges made their awards according to the accuracy of the interpretation, on the part of the exhibitor, of the definitions of the various grades.

At a number of exhibitions where no extensive classes for eggs have been offered, the Live Stock Branch has made a display of eggs graded in accordance with the standards and in each instance has supplemented the display with actual demonstrations in a candling booth specially designed for the purpose, of the way in which eggs of the various grades appear when candled.

In order that the consumers and producers generally may become more familiar with the various classes and grades the following explanation is given.

Three general classes for eggs are provided under the standards viz:—

"Fresh gathered", "Storage", and "Cracked and Dirties". Four grades are provided in the first class, three in the second, and two in the third.

The grades in the "Fresh Gathered" Class are "Specials", "Extras", "No. 1's", and "No. 2's". The grade "Specials" is omitted from the "Storage" class, and both specials and extras form the class for "Cracked and Dirties".

"Specials" according to the standards are eggs of uniform size weighing over 24 ounces to the dozen or over 45 pounds net to the 30 dozen case; absolutely clean, strong and sound in shell; air cell small, not over 3-16 of an inch in depth; white of egg firm and clear and yolk dimly visible; free from blood clots.

"Extras" are eggs of good size, weighing at least 24 ounces to the dozen or 45 pounds net to the 30 dozen case; clean, sound in shell; air cell less than ⅜ of an inch in depth; with white of egg firm, and yolk slightly visible.

"No. 1's" are eggs weighing at least 23 ounces to the dozen or 43 pounds net to the 30 dozen case; clean, sound in shell; air cell less than ½ inch in depth; white of egg reasonably firm; yolk visible but mobile, not stuck to the shell or seriously out of place.

"No. 2's" are eggs clean; sound in shell; may contain weak watery eggs, and eggs with heavy yolks, and all other eggs sound in shell and fit for food.

Consumers in order to protect themselves in the matter of purshasing eggs should acquaint themselves with these standards and the above definitions of the grades. Only by creating a demand for certain grades of eggs will the supply be forthcoming, and the demand can come only with a thorough knowledge on the part of the consumer as to what constitutes the various grades. It has also been frequently suggested that since the adoption of the standards consumers generally. in order to safeguard themselves, would do well to insist that all eggs as offered for sale be labelled in accordance with their proper grade.

Producers too, would do well to more systematically grade their eggs before marketing, and knowing definitely what they have in hand thereby be in a better position to demand a price commensurate with the quality supplied.

NEW TRAINING FOR RURAL TEACHERS IN QUEBEC

IN eighteen months there will be important changes in the training of rural teachers in the Province of Quebec and it will be necessary for the farming community to take notice of these impending changes, which will have an important bearing on the future of their daughters who become teachers, and of their children in the schools.

If there is one profession which closely concerns the farmer, it is the teaching profession; and they are interested in it for several very important reasons. In the first place, they have to pay taxes to maintain a trained teacher in their rural school and the market value of a trained teacher has increased considerably in the last ten years due to the universal trend towards better salaries. If they wish to retain trained rural teachers in their own schools they must pay salaries sufficient to retain them, and increase these salaries for each year of service and experience.

In the second place, farmers wish to give their children a good education and recognize readily that a school near a farm enhances the value of that farm.

Lastly, they are interested in the teaching profession because so many of their daughters enter it and afterwards return to rural schools. It is interesting to note that out of a total of 189 women students taking their professional training at Macdonald College this year, no fewer than 68 come from farm homes. In other words, more than one third of our new teachers each year come from the farm.

Farmers, therefore, are sure to be greatly interested in the training of their daughters. As the present system of training elementary teachers is to be changed altogether in 1917, it will be necessary for intending students and their parents to note any changes from time to time and prepare themselves accordingly.

At present the numbers of trained elementary teachers are less than the numbers required for our purely rural schools. Trained teachers are not always willing to go far from their homes to outlying districts for inadequate salaries and for this reason as well as on account of the apathy of school boards, many persons are employed as teachers who have no professional qualifications whatever. This has been felt to be an unendurable state of affairs and for the purpose of giving unqualified teachers some opportunity of learning their craft, a summer school was instituted some three years ago at Lachute. This was from the first recognized to be merely a temporary provision, a mere palliative, a device "to do something" for rural teachers who were possibly unable for financial reasons to take a full and proper course of training at the normal school. At the beginning only teachers actually employed were admitted and partially helped to improve their work in rural schools. Later on, pupils from schools were admitted and certificated. This scheme, therefore, tended to lower the standard of professional training and will be abolished in 1917. However, the existence of this course and the large number of applicants for it have proved that there is a considerable number of young women who are for various reasons unable or unwilling to take a year's training, but who would be available for teaching in rural schools if they could get a shorter course than the present session which lasts nine and a half months.

The Protestant Committee of the Council of Public Instruction is attempting to get some satisfactory scheme to put the training of rural teachers on a permanent basis. A general outline of changes has been agreed upon, but all the details have not been fixed. The intention in short is to abolish the Lachute Summer School in 1917, and for the present elementary class at Macdonald College to substitute two shorter courses of four months each, one before Christmas and the other after Christmas. At present the elementary class is too small to supply all the needs of the province. More than one hundred teachers are needed for our rural schools each year and these young teachers must come from the locality which wants the teachers. It is useless to expect Sherbrooke girls to go to Gaspe and Knowlton girls to go to Pontiac and Ottawa counties.

This change from a whole year's course to one of four months is, on the surface, a concession to the social and economic status of intending teachers and will have a tendency to lower the professional standard. This criticism is, however, met by the fact that trained teachers in rural schools are scarce; and the number available is less than it might be, owing to the attractions of town and city life. In other words, it is thought better to aim at 800 teachers with four months' training than 200 teachers with ten months' training.

It is also likely that the entrance requirements for the new short terms in 1917 will be Academy II standing or the new grade 10. This will increase the academic standard of candidates before entrance to the School for Teachers.

In the meantime then, Lachute Summer School will only be continued in the summers of 1916 and 1917.

In the summer of 1916, new admissions will be few. Entrance will be confined to two classes of students:—

(a) Those candidates who have already received a provisional diploma from the summer school and (b) only such additional candidates as can be accommodated, who shall be selected only from those who have already had experience in teaching.

Thus if 80 students with provisional diplomas apply for admission, only 40 unqualified teachers already in schools will be admitted to make up the total of 120 for which accommodation can be provided.

In 1917, the Summer School will be held only for the benefit of the 40 or those of them who care to return.

In the year beginning September 1917, at Macdonald College, two short courses will be instituted in place of the present elementary class, which lasts nine months, one before Christmas and one after Christmas, each complete in itself.

Elementary diplomas will probably be given to successful candidates.

It will thus be seen that no pupils leaving academies will be admitted to the Lachute Summer School, either in 1916 or in 1917. But something will be done for a small number of existing unqualified teachers. Thereafter it will be necessary for all who desire training to take one of the two courses before or after Christmas 1917 in the School for Teachers.

This, of course, shortens the length of training for elementary teachers, but the intention is to insist on high academic standing as a condition for entrance. Thus it is thought that there will be no necessity for doing purely academic work in the college, but that the whole time of the students will be devoted to professional subjects.

Much remains to be worked out in detail. For instance, what inducement will be offered in the shape of a bonus or bursary to successful candidates promising to teach a stated number of years in a rural school in the Province?

What high school standing shall be required for entrance to the School for Teachers? What subjects shall be insisted on in the high school course as essential for future usefulness as teachers?

What subjects shall be contained in the professional course of the new elementary class? Which students shall be admitted in September and which in January?

These details demand serious consideration and will be published as soon as adopted by the Protestant Committee. But academy pupils intending to be elementary teachers will in future require to take a professional course in the School for Teachers. The Lachute Summer School will not be available for them. The last year for the full nine months' training will be open in September 1916, and as many pupils as possible should take advantage of it. Thereafter only a four months' course, with perhaps higher academic standing for entrance, will be available.

This new scheme is much the same as that which exists in Ontario, where the Normal Schools give the full year's training for a second class certificate and the Model Schools with a special staff give a three months' course for rural schools.

Another difficulty, however, arises and seems insoluble. The district of Inspector Honeyman includes the many rural schools in Pontiac and Ottawa counties for which there is no proper source of trained teachers. With the exception of Shawville Academy and perhaps Buckingham Academy there is no chance of students getting their high school education as a preparation for normal school work. Of course there is also the model school at Hull and another at Wakefield, but there will always be a shortage in the supply of trained teachers in this western part of the province because there are no facilities for pupils to prepare themselves properly. For instance, there are thirty schools in this inspectoral district stretching along a line of 300 miles with Hull and Wakefield model schools as the nearest Superior Schools. This district is an exceptional one and only brings out more clearly the necessity of drawing a supply of student teachers from each locality, which will afterwards employ them. In other words, districts which desire properly trained teachers should send their own district pupils to the Normal College.

It is hoped that the institution of two short courses will meet this scarcity of rural teachers in the sparsely populated Protestant sections of the province. But it certainly seems as if nothing short of an occasional summer course with exceptional financial bonuses could do much for the counties of Pontiac and Ottawa.

SINCLAIR LAIRD

THE VEGETABLE GARDEN

DON'T sow seed on poorly prepared land. It means more work and often poor returns.

Plant several sowings of peas, beans, spinach, corn, radish, and lettuce.

Cabbage, cauliflower, and kohl rabi may be set out early in May.

Harden off all plants before setting in the open ground. This is done by reducing the amount of water given and giving more air to the plant. It is simply a hardening of the tissues to withstand field conditions better.

Swiss chard, or leaf beet, makes excellent greens and will last much later in the season than spinach.

Treat all potatoes before planting with corrosive sublimate or formalin for scab. Then plant on clean land.

A planting of sweet corn should be made as soon as all danger from frost is over.

Late cabbage may be sown in the cold frame or open ground.

Keep the cultivator busy in both garden and orchard. It pays.

Keep a sharp lookout for the cut worms.

Plant spinach, radish, lettuce, onions, peas, and other early garden vegetables.

Start a few muskmelons, cucumbers and watermelons in pots or boxes in the cold frame.

The hop vine, wild cucumber, cardinal climber, and morning glory are good annual vines to use as screens.

Cut asparagus just below the surface of the ground rather than break it. Breaking is apt to injure the crowns.

Old apple trees should be scraped at least once in three years for the removal of rough bark that may harbor insect enemies. A hoe, hollowed out in the centre to fit the round of the tree, is the most efficient tool for the purpose.

THE ANGORA GOAT

ACCORDING to T. Reginald Arkell and Horace V. Bent who have prepared a pamphlet on the subject, for the Live Stock Branch of the Dominion Department of Agriculture, the Angora goat can be raised in most points of Canada where live stock production prevails. The Angora goat produces the hair which is known as "mohair". This long, fine lustrous hair is used in the manufacture of plushes, velvets and lap robes, the plush seat coverings of railway carriages being made of it. Mohair dress goods, which have something of the lustre of silk, are well known to the ladies and serges, shawls, rugs and other materials are also made from this goat hair. There is also a good demand for the skins, which are used as furs and rugs. The flesh of the young Angora is regarded by many as equal if not superior to lamb.

The Angora goat is specially adapted to high dry land and shares with the common goat the foraging instinct that renders it so valuable as a brush clearer. It is, however, more delicate than the common goat and, like the sheep, is subject to attacks by dogs. It is also subject to the diseases which attack sheep. Shelter is necessary in wet or stormy weather. The goat will withstand cold, providing it is kept dry. As with other classes of farm animals careful selection of breeding stock and good management are essential to the highest success.

Reliable advice as to the management, feeding, breeding and shearing of this goat, together with information about the diseases to which it is liable, will be found in the pamphlet in question. Copies may be obtained upon application to the Live Stock Branch, Department of Agriculture, Ottawa.

With its triple functions of hair-production, meat-production and brush extermination the Angora goat ought to prove valuable upon some of our rougher lands in the province of Quebec.

WINTER CARE OF STOCK

Profitable Wintering of Farm Animals Depends largely upon Economical Feeding

THE winter season is here and with it approaches the winter feeding problem. It is time to consider what feed can most profitably be used. Grains will be high and should be fed judiciously. The bulk of the feed used for wintering stock should be made up of roughages from the farm. Small amounts of concentrates, fed daily with these feeds, make comparatively cheap rations entirely suitable to certain 'classes of live stock.

For convenience in planning winter feeding, farm animals may be divided into three classes:

1. Mature animals not producing an income during winter months.

II. Animals producing an income during the winter.

III. Young and growing stock to be retained on the farm the following summer.

In Class I may be included all mature live stock held on the farm, either for breeding purposes, future work, or finishing for market the following summer.

In Class II may be included work horses, cows producing milk, and stock being fattened for market or conditioned for sale during the winter months.

In Class III may be included all young and growing stock on the farm. The big saving in the winter feed bill can be made with Class I. This does not mean that animals of this class should be permitted to come through the winter in a run-down and weakened condition. Rather than consider such a practice, it would be far better to sell the stock in the fall. It is meant, however, that they can and should be maintained on the cheaper feeds. Roughages, supplemented by a small amount of concentrates (oil meal or grain) are in favor for them. Corn silage will be invaluable at this time, especially for cattle and sheep. Keep the feed racks filled with corn stover, hay, and straw, but do not be wasteful in the feeding.

The amount of grain to put in the trough can not definitely be given. The same should vary in accordance with severeness of winter and condition of stock. This is a point that can only be decided in the feed lot. To permit the stock to go entirely without concentrates at this time would be a grave mistake, and in all probability make impossible the task of bringing it to spring feed in a healthy and vigorous condition. Such a condition is imperative in the case of breeding animals and essential for feeders if best results are to be obtained.

The matter of feeding hogs, included in Class I, presents an entirely different problem from that of the other stock. It is true that they may profitably be run on grain fields, meadows, and pastures before snow arrives, but concentrates must constitute much of their ration after outside fields are closed for winter. Roots, chopped alfalfa hay, apples, and waste products of the dairy and household will do much toward keeping down the cost of their winter feed. In fact, any products that will substitute for the forages and grasses in the field, which feeds are so essential to the conditioning of brood sows, can well be used.

Concerning the feed for stock included in Class II little need be said. It is a fact well known that horses at work require both care and feed. This they must receive if their work is done. To furnish the dairy cow with rations not intended to meet the demands made upon her system by the milk she gives would defeat the purpose for which she is kept. Equally certain would the stinting of the ration of fattening steers or hogs fail to make them ready for the Christmas market. As the food requirement for these different classes of live stock is a matter of common knowledge to stockmen, it remains only to see that it is provided in abundance.

With Class III, the young and growing stock, most costly mistakes in feeding occur. A full realization of the fact that cheapest and most rapid gains in live stock are made with younger animals should do much toward obviating losses to farmers through insufficient and improper feeding of such animals. The failure to put gains on animals during the growing period intended for them by nature can not be corrected by copious feeding at any later time. Their growth has been stunted, and rarely will they fully recover from the earlier setback. Even when they do it is a costly practice to put growth and flesh on a stunted animal, as compared to what could have been done when he was in a healthy and vigorous condition.

But it is not necessary that young stock be fed as are fattening animals. Watch their feed troughs and see that all of the daily rations are consumed. Do not feed them in excess, but make certain they are contented after each feeding. See that the exercise lot is used daily and that clean water is provided. The failure to feed young stock properly will open the way for future serious troubles, and no stockman can afford to encourage such a practice, even during the winter months.—*Weekly News Letter, U. S. Dept. Agr.*

WINTER FEEDING HINTS

FEED the live stock carefully; the spring pasture is a long way off. Plan to give the pasture a good chance next year by conserving a reserve of roughage for spring feeding.

Laxative feed and exercise are the secrets of successful feeding. Should ensilage or roots be short, molasses makes a very good supplement when fed at from two to four pounds per head per day.

Cut-feed means less waste and greater palatability. Cut straw mixed with the ensilage, or hay that would otherwise be wasted, cut and mixed with the ensilage and roots is a great saving to the feeder, yet a mixture which is very acceptable to the stock.

Good rations for any class of live stock must be well balanced as to variety and palatability, succulence and nutrition. No two animals respond the same to any one food-stuff; a study of the feeding of individuals is most essential and most remunerative.

Careful, co-operative buying of the necessary mill feeds is profitable, and will lead to healthy co-operation in all live stock operations in any neighbourhood.

Make, and keep, at least this *one* New Year's resolution, namely: *to make every pound of feed more profitable by better feeding methods.—E.S. Archibald, Dominion Animal Husbandman.*

THE IDLE HORSE IN WINTER

IT has been proved by many experiments that the idle work-horse in winter may maintain his weight, or even increase in weight, on a ration composed of one pound of hay, one pound of straw, and one pound of carrots or turnips per day per hundred pounds live weight.

It is wise to take special care with the stallion during winter months; a light grain ration and plenty of exercise prevents him from getting over-fat—a condition which usually results in diminished fertility the next breeding season.

In-foal mares, especially, should be exercised daily; over-fat, unexercised mares usually show 60 per cent greater mortality and less ruggedness in their foals.

Keep the colts growing. An outside shed with a good run is the best place for the colts, except in very cold weather. Keep them growing with good grain, hay and roots; the size and quality of bone in the future horse may be largely determined by the way in which he is developed during the first winter.

WINTER FEEDING OF PREGNANT EWES

An excellent ration is composed of clover hay, two to three pounds, and roots, two to three pounds per day. This is sufficient except when ewes are thin, in which case a meal mixture also should be fed at the rate of about a half pound per day. A good meal mixture consists of oats, two parts; bran, one part and linseed oil cake or peas, one part. Ewes lambing in February, March or April should be well prepared with the use of the above ration.

The most economical use of roughages is the secret of successful sheep feeding. If good clover hay is absent, the cheaper roughages must be supplemented with grain. Pea straw, unthreshed, is an excellent substitute for clover hay; pea straw, threshed, must be supplemented with grain. Fine grass hays may require an addition of some grain in order to take the place of clover hay. It would be better to feed coarse grass hays to some other class of stock.

Ensilage may take the place of roots to within a month of lambing, at which time ensilage should be stopped and roots gradually decreased until after lambing.

For feeding sheep, the roots may be either mangels, turnips, or sugar beets, except in the case of rams, where turnips only should compose the root-ration.

WINTER FEEDING OF LAMBS

A good ration consists of clover or alfalfa hay, two pounds; roots, two pounds, and corn ensilage, two pounds. Should all of the above roughages not be available, a limited amount of grain mixture composed of equal parts of oats and bran should be added to keep the lambs growing steadily and in fair flesh. Lambs made over-fat during the first winter will not attain the size necessary for the breeding of large market lambs.

ASHES AS A FERTILIZER

Contain Potash and Phosphoric Acid—Should be Kept Dry and Not Permitted to Leach

THE farmer who burns wood for heating and cooking should carefully store the ashes and not permit them to leach, as they have a peculiar fertilizing value. They not only contain potash and phosphoric acid in appreciable amounts, but also contain magnesia and lime, and when applied to the land they also act indirectly to increase the available nitrogen content of organic matter in the soil.

Ordinary house ashes contain on the average about 8 or 9 per cent of potash and 2 per cent of phosphoric acid. Investigators have considered that there is enough potash and phosphoric acid in a bushel of ashes to make it worth 20 or 25 cents. Besides that, some 10 or 15 cents additional might be allowed for the "alkali power" of the ashes. This power is that which enables ashes to rot weeds and to ferment peat. The potash content of ashes will be lost if they are permitted to leach, and care should be taken to store them in a dry place.

TO WHAT FAMILY DO YOUR POTATOES BELONG ?

"To what family do your potatoes belong? The farmer who desires to know may obtain some enlightenment from a new bulletin of the department entitled "Group classification and varietal descriptions of some American potatoes." This is a professional paper and deals in detail with each potato family considered.

A more intimate knowledge of the potato is much to be desired, not only by scientists, but by the farmers who grow them. If the latter can recognize old varieties under new names, he will not be deceived by the present practice of some seedsmen who manufacture new varieties from old ones.

The bulletin does not claim to present a complete classification of all American potatoes, but endeavors to offer a list that may prove a starting point upon which to enlarge later on. The bulletin gives the following "classification key" briefly describing each of 11 groups:

CLASSIFICATION KEY

Group 1.—Cobbler

Tubers: Roundish; skin creamy white.

Sprouts: Base, leaf scales, and tips slightly or distinctly tinged with reddish violet or magenta. In many cases the color is absent.

Flowers: Light rose-purple; under intense heat may be almost white.

Group 2.—Triumph

Tubers: Roundish; skin creamy white, with more or less numerous splashes of red, or carmine, or solid red; maturing very early.

Sprouts: Base, leaf scales, and tips more or less deeply suffused with reddish violet.

Flowers: Very light rose-purple.

Group 3.—Early Michigan

Tubers: Oblong or elongate-flattened; skin white or creamy white, occasionally suffused with pink around bud-eye cluster in Early Albino.

Sprouts: Base light rose-purple; tips creamy white or light rose-purple.
Flowers: White.

Group 4.—Rose

Tubers: Roundish oblong to elongate-flattened or spindle-shape flattened; skin flesh colored or pink, or (in the case of the White Rose) white.

Sprouts: Base and internodes creamy white to deep rose-lilac; leaf scales and tips cream to rose-lilac.

Flowers: White in sections 1 and 2; rose-lilac in section 3.

Group 5.—Early Ohio

Tubers: Round, oblong, or ovoid; skin flesh colored or light pink, with numerous small, raised, russet dots.

Sprouts: Base, leaf scales, and tips more or less deeply suffused with carmine-lilac to violet-lilac or magenta.
Flowers: White.

Group 6.—Hebron

Tubers: Elongated, somewhat flattened, sometimes spindle shaped; skin creamy white, more or less clouded with flesh color or light pink.

Sprouts: Base creamy white to light lilac; leaf scales and tips pure mauve to magenta, but color sometimes absent.

Flowers: White.

Group 7.—Burbank

Tubers: Long, cylindrical to somewhat flattened, inclined to be slightly spindle-shaped; skin white to light creamy white, smooth and glistening, or deep russet in the case of section 2.

Sprouts: Base creamy white or faintly tinged with magenta: leaf scales and tips usually lightly tinged with magenta.

Flowers: White.

Group 8.—Green Mountain

Tubers: Moderately to distinctly oblong, usually broad, flattened; skin a dull creamy or light russet color, frequently having russet - brown splashes toward the seed end.

Sprouts: Section 1 — base, leaf scales, and tips creamy white; section 2—base usually white, occasionally tinged with magenta; leaf scales and tips tinged with lilac to magenta.

Flowers: White.

Group 9.—Rural

Tubers: Broadly round-flattened to short, oblong, or distinctly oblong-flattened; skin creamy white.

Sprouts: Base dull white; leaf scales and tips violet-purple to pansy violet.

Flowers: Central portion of corolla deep violet, with the purple growing lighter toward the outer portion; five points of corolla white.

Group 10.—Pearl

Tubers: Round-flattened to heart-shape flattened; usually heavily shouldered; skin a dull white, dull russet, or brownish white in section 1 or a deep bluish purple in section 2.

Sprouts : Section 1 — base, leaf scales, and tips usually faintly tinged with lilac; section 2—base, leaf scales, and tips vinous mauve.

Flowers: White.

Group 11.—Peachblow

Tubers: Round to round-flattened or round-oblong; skin creamy white, splashed with crimson or solid pink; eyes usually bright carmine. Includes some early-maturing varieties.

Sprouts: Base, leaf scales, and tips more or less suffused with reddish violet.

Flowers: Purple.

In deciding upon the name by which each group shall be known an attempt has been made to select that of the variety which seems most nearly to represent the group as a whole and which at the same time is most widely known.

Each of the groups is described in greater detail in the bulletin, as for instance:

TRIUMPH GROUP

The Triumph group is composed of a few very early varieties having roundish tubers and a dwarf habit of growth. Only one member of this group, the Triumph, can be regarded as having any considerable commercial importance.

Description. — Ripens very early, but the yield is low. Vines dwarfed and fairly compact, not much branched. Stems short, stocky, dark green. Leaves medium large and dark green. Flowers purple or rose-lilac. Tubers round with blunt to obtuse ends, slightly to distinctly shouldered. Eyes medium in number and depth; budeye cluster generally deeply set. Skin creamy white, occasionally with pink eyes or splashed (as in White Triumph) with few or many splashes of crimson (as in the Quick Lunch and Noroton Beauty) or solid red, or occasionally splashed with carmine(as in the Triumph). Flesh a creamy white. Sprouts have base leaf scales, and tips more or less deeply diffused with reddish violet.

The descriptions of varieties printed in the bulletin cover only about one-fifth of the varieties upon which the department's scientists have been working. It has been the object to include in the list mainly those whose commercial importance or value from the standpoint of the plant breeder make them of more general interest. The plant breeder in particular may gain some assistance from this list, as it may give him some idea as to what can be expected from the union of any two given varieties.—*News Letter, Dept. of Agric., U. S.*

BEEF RAISING IN CANADA

There has been issued at Ottawa a new edition of Bulletin No. 13 of the Live Stock Branch, "Beef Raising in Canada." It is available on application to the Publications Branch of the Department of Agriculture. Upwards of one hundred pages and nearly as many half-tone illustrations, conveying valuable information are given. Among the contributors are many of the best informed and most experienced beef raisers and experimenters in Canada.

A section is devoted to descriptive accounts of the various breeds of beef cattle in this country, while practical information on breeding, rearing, housing, and marketing is also contained.

In dealing with the finished steer it is rightly remarked that to succeed the requirements of the purchaser must be complied with. The standard of the beef market has changed great-

ONLY 3 MOVING PARTS
SANDOW ENGINES
Over 20,000 in use for general farm work, irrigation, operating binders, railroad track cars, portable outfit, etc. Particularly adapted for electric lighting, which requires absolutely uniform power.
30 DAYS Free Trial
10 Year Guarantee
Run on kerosene, distillate, gasoline, etc. No cranking. Run in either direction. Reversible while running. Water cooled. Light in weight. Simple design eliminates engine trouble. Child can operate. Price low. Handsome new engine book tells you why you should have a **Sandow**
Write for it today.
Detroit Motor Car Supply Co.
119 Canton Ave.
Detroit, Mich.

SUNSHINE or RAIN
White's Weather Prophet forecasts the weather 8 to 24 hours in advance. Not a toy but a scientifically constructed instrument working automatically. AN IDEAL PRESENT made doubly interesting by the little figures of Jean et Greta and the Witch, who come in and out to tell you what the weather will be. Handsome, reliable and everlasting.
DAVID WHITE
AGENTS WANTED
Size 6½ by 7½; fully guaranteed. Sent prepaid to any address in the United States or Canada for - - - $1.00
DAVID WHITE, Dept. 102 East Water St. Milwaukee, Wis.

A GREAT PARCEL POST OFFER
A regular $4.00 **Vacuum Clothes Washer** complete with exhaust protectors and handle, **Postpaid** for only $1.75. Your money returned if not satisfied. Washes finest laces or heaviest blankets. Saves rubbing and wearing out of the cloths. $20 machines have been discarded for it. Order one to-day, don't wait.
Agents Wanted.
GRAND & McMILLAN,
Dept. K2
Box 353, Toronto

WINDMILLS
IDEAL BRANTFORD
Our Double-Geared "Ideal" Pumping Windmill has double strength. If pull-in wire breaks in storm mill goes out of gear. Wheel and Vane galvanized after made.
Our towers are girted every five feet and are double braced, and braces locked to girts where they cross.
We can supply you with the best outfit made. We manufacture a full line of
Gasoline Engines, Grain Grinders, Saw Frames, Pumps, Tanks, Water Boxes, Concrete Mixers, Etc.
If interested send for catalogues.
Goold Shapley & Muir Co., LIMITED
Brantford, Ont.

ly in recent years. The bullock that commands the highest price is a compact, well finished animal weighing not more than 1,500 lbs. on foot and if he weighs only 1,200 lbs. he will fetch the top figure, provided he has the form, quality and finish. Even the thousand pound "baby beef" is looked for by the best buyers on this side of the Atlantic, but such cattle are not shipped abroad. The change is greatly to the advantage of the producer, as other things being equal, the younger the animal goes to market the less is the cost of food and the greater the profit to the producer. To secure delicate flavour and tenderness a certain proportion of fat is necessary and this should be incorporated with the flesh or lean meat rather than appear only as a covering to the muscles. The great secret in producing a carcass of beef is to treat an animal in such a way that the fat grows with it during the entire period of its life time. It is unfortunately the too common practice of Canadian beef raisers to produce all the fat that an animal carries in the course of a few months. Much of the fat put on in this way is deposited on the outside of the carcass; it is largely wasted, as it is useful for little else than tallow. The carcass that dresses out showing specks and streaks of fat throughout the lean tissue commands the highest price. The only way to be sure of prime quality is to maintain the animal in good condition by a system of liberal feeding from birth to maturity. Then the finishing period is comparatively short and the carcass produces the highly desirable marbled beef.

ONE FARM THAT WAS MADE TO PAY

A significant instance of what proper methods of farm management can accomplish is afforded by a certain 500-acre farm in central Michigan. For 10 years this farm failed to pay interest on the capital invested. One year after the owners had been induced to make certain radical changes the farm paid all the expenses of operation and returned them 5 per cent on an investment of $60,000. The changes which accomplished this financial revolution were as follows:

(1) Four - horse machinery was substituted for 2-horse.

(2) The unprofitable cows in the dairy herd were weeded out and sold and the money received for them invested in better stock.

(3) A silo was built.

(4) The foreman was allowed, in addition to his salary, 10 per cent of the net income from the farm. The expenses of operating the farm, but not the interest on the capital, were deducted from the income before the foreman received his percentage.

It was this last suggestion which met with the most opposition from the owners of the farm, but when it was pointed out to them that for every dollar the foreman got under such an arrangement they would get $9 they yielded.

FARM MANAGEMENT

Fundamental Principles of the Business of Farming Stated by Government Specialists

CERTAIN fundamental principles of farm management are advanced by specialists of the United States Department of Agriculture as having been brought out or substantiated by a thorough agricultural survey of an old and representative farming section of Chester County, Pa. These principles are summarized as follows:

Farming conforms to local soil, climate, labor, and market conditions as well as to the business conditions of the individual farm.

When conditions remain unchanged for a long time, farming becomes approximately what it ought to be to get the best results, provided that practice which is immediately the most profitable does not deplete soil fertility.

Success in farming, measured in per cent of profit on investment, does not depend on the magnitude of the farm business, but measured in terms of the standard of living of the farm family it is directly proportional to the magnitude of business.

Profits increase as yields per acre increase until the yields are considerably above the average for the locality, but beyond this point increased yields are obtained at a loss.

In quantity of product per dairy cow the point of diminishing returns is not reached in ordinary farm practice.

It is easier and more profitable to increase low yields per acre than high ones, and small product per cow than large product. In other words, profits can be increased more easily by attention to the weakest points in a farming system.

There is a way of grouping the enterprises of a farm that is more profitable than any other way; that is, there is a certain most profitable acreage for each crop and a most profitable proportion of income from any one source.

Some enterprises, such as poultry keeping, may easily be made profitable as side lines, yet are difficult to make profitable when made a main feature of the farm business.

Production costs much more per bushel or per ton on the small farm than on the large farm of the same type.

Diversity of business is an important factor of success on the average farm. A moderate degree of diversity is better than either extreme.

For your separator you want a Cleaner that cleans hygienically without leaving a greasy film — use

Old Dutch

Talk It Over With Your Neighbor

Farmer Smith:—Brown, how's come I have such hard luck with my horses getting sores and galls in spring? Your horses are always fresh as daisies. I always do have the worst luck with everything.

Farmer Brown:—It isn't a matter of luck at all, Smith, it's preparation.

Farmer Smith:—Whad'ye mean, preparation?

Farmer Brown:—I'll tell you. Conditions on my farm are the same as on yours. My horses fatten up in winter and become thin when they are put out to spring work. If I used ordinary collars alone, my horses would quickly become chafed and galled the same as yours do. But I know that a horse in the harness is worth two in the stall, and by spending a few cents I prevent the loss of my horse' services during the busiest months of the year. I protect them with Tapatco

PADS FOR HORSES

These pads are well worth their small cost for the comfort they afford your horses. They increase the working power of every horse that wears one. They take your galled horse out of the stall and keep it in the field. Every horse on your farm can do a bigger day's work if it is Tapatco Padded, because it feels better and is freed from galls and sores.

Ask Your Dealer for Free Booklet. Do this much for the horse that has served you so well. The book illustrates the full line in colors and also contains some valuable emergency horse treatments.

We also make a complete line of Riding Saddle Pads.

The American Pad & Textile Co., - - - Chatham, Ont.

FURS

Get "More Money" for your Foxes
Muskrat, White Weasel, Beaver, Lynx, Wolves, Marten and other Fur bearers collected in your section

SHIP YOUR FURS DIRECT to "SHUBERT" the largest house in the World dealing exclusively in NORTH AMERICAN RAW FURS a reliable—responsible—safe Fur House with an unblemished reputation existing for "more than a third of a century," a long successful record of sending Fur Shippers prompt, SATISFACTORY AND PROFITABLE returns. Write for "The Shubert Shipper," the only reliable, accurate market report and price list published.

Write for it—NOW—it's FREE

A. B. SHUBERT, Inc. 25-27 WEST AUSTIN AVE.
Dept. C 520 CHICAGO, U.S.A.

THE SOIL'S STORE OF HUMUS

VIRGIN LOAMS.—Nature keeps up, and is constantly adding to, the soil's store of humus, by the annual fall and decay of leaves, the death of small plants, etc. These residues, as we may call them, accumulate from year to year in and on the soil, and in the course of time become part and parcel thereof.

Thus we have in outline the making of a rich, fertile, virgin soil.

WORN-OUT SOILS.—The wearing out of soils—by which is understood the decline of yields through *cropping under an irrational method of farming*—is due not so much to the abstraction of plant food as to loss of humus or semi-decayed vegetable matter. *Humus* is the constituent which above all others makes a soil a favourable growing place for crops. This it does by improving the soil's texture or tilth, by increasing its moisture-holding capacity, by maintaining the microscopic life which prepares plant food in available forms and by storing and gradually liberating nitrogen — the most important of all the elements of plant food. It is humus that imparts the "loamy" quality to a soil; a "rich loam" is the finest type of soil and invariably such contains an abundance of decaying organic matter; a poor or harsh soil is one deficient in humus.

VALUE OF MANURE.—The history of "worn-out" soils usually is that they have been continuously bearing crops—as, for instance, oats and potatoes—that left little organic residues and have not received any, or very small amounts, of manure.

These facts explain the exceptional value of manure for restoring these soils, for manure not only supplies plant food but furnishes a large amount of vegetable organic matter, which in the soil becomes *humus*, improving the soil in the various ways we have indicated and infusing or inoculating it with "life".

GREEN MANURING. — This explanation also holds good for the improvement of soils by the turning under of green crops—green-manuring as it is called—buckwheat, rye and, above all, a leguminous crop (clover, alfalfa, peas, etc.). The legumes are the most valuable for this purpose, as in addition to their organic matter they enrich the soil with much nitrogen obtained from the air. —*F. T. Shutt, Dominion Chemist.*

Crops grown at a potential profit may, by being fed to a poor grade of live stock, be turned into an actual loss.

DIVERSITY OF FARM ENTERPRISES

IN most cases where studies on the profits in farming have been made, particularly in our oldest agricultural districts, such studies indicate that the most successful farms are those which have from two to four major sources of income; i. e., they have a well-balanced and diversified business. In certain instances it may pay better to have only one enterprise, but usually when one crop pays much better than all others the production of it increases rapidly and soon the price falls to the point where other crops or products are equally as profitable. Diversified farming is often confused with farming where there is a little of everything and not much of anything. Either extreme lessens the chances of success. When the price of certain crops is very low then live stock usually becomes desirable. However, if the returns per animal are poor, cash crops even at a low price are essential. A well-balanced business insures against losses and provides a much better utilization of the labor and equipment.

Here is a mixture of kingdoms, if not of metaphors, taken from a history examination paper:

"He stretched his sultry length beneath the ewe-tree's shade."

"Away back as far as the time of Jack Carter England sent her ships into Hudson Bay to trade beads and muskets with the Indians for ivory off the walrus-tree."—*Century.*

Richardson, the painter, used to speak of an open, honest country gentleman who one day asked him to come to his house, adding. "I wish very much to see you, for I have just purchased a picture by Rubens. It is a rare good one. Brown saw it, and says it is a copy. A copy! If any man living dares to say it is a copy I will break every bone in his skin! Pray. call on me and give me your opinion."

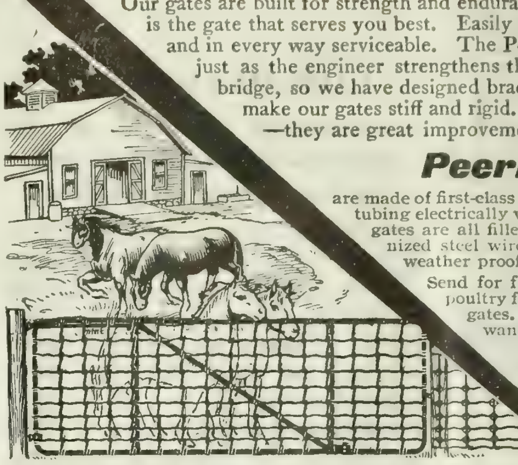
Someone noticed that Pat was ambidextrous. 'When I was a boy,' he explained, 'me father always said to me: "Pat, learn to cut yer finger nails wid yer left hand, for some day ye might lose yer right hand."—Boston 'Transcript.'

Two Irishmen sallied forth one day in search of sport. .They were armed with guns and huge game bags, and as it was their first venture at shooting they were tremendously keen.

Suddenly Meehan spotted a bird, and, taking very careful aim, prepared to fire the fatal shot. Then Fergus seized him by the arm frantically, crying: .

'Fer th' mercy's sake, don't fire, Meehan! Shure an' ye've fergotten to load yer gun!'

'That's as it may be, me lad,' retorted Meehan, 'but fire I must! Begorrah, th' burrud won't wait!'



PEERLESS EXTRA LONG EXTRA STRONG **GATE**

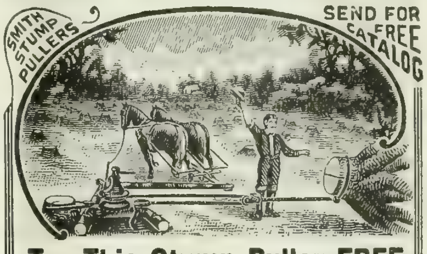
Our gates are built for strength and endurance. Braced like a steel bridge. It is the gate that serves you best. Easily hung, quickly adjusted, convenient and in every way serviceable. The Peerless is braced like a steel bridge, just as the engineer strengthens the points of strain in a big, mighty bridge, so we have designed braces, stronger than was necessary, to make our gates stiff and rigid. They can't sag—they can't twist —they are great improvements over gates made the old way.

Peerless Gates

are made of first-class material. Frame-work of 1⅜ inch steel tubing electrically welded together. Peerless pipe braced gates are all filled with heavy No. 9 Open Hearth galvanized steel wire—built for strength and durability—weather proof and stock proof.

Send for free catalog. Ask about our farm and poultry fencing, also our ornamental fence and gates. Agents nearly everywhere. Agents wanted in open territory.

The Banwell - Hoxie Wire Fence Co.,
LIMITED
Winnipeg, Man., Hamilton, Ont.



Try This Stump Puller FREE

We want a Smith machine on every stump and timbered farm in the country; **it will clear from one to three acres a day, pulling the largest stumps and trees quicker than the holes can be bored for dynamite**. The Smith Stump Puller will transform your waste lands into the most productive, while the first crop on one acre will more than pay for the machine.

Our Three Year Guarantee

We give you a guarantee to replace any casting broken on the Smith machine for three years from date of purchase. **Our catalog tells you all about it, shows why the Smith Stump Puller is the most profitable implement made for farm use today, and explains our Special Introductory Offer and our Free Trial Proposition.** Send us your name and we will send it free.

W. Smith Grubber Co.
32 ***Smith Sta., La Crescent, Minn.***

VIGORA

YOUR HORSE CURED

of Coughs, Glanders, Broken-wind, Worms, Skin-diseases, etc., Good strong tonic for the blood, tones up the horse and keeps it healthy.

PRICE 50c A BOTTLE
ON SALE EVERYWHERE

Get all information from

J. B. MORIN, Wholesale Druggist
QUEBEC, CANADA.

Funsten
Pays Cash for FURS

Prices Higher This Year

Big Money in Trapping skunk, coon, mink, muskrat, fox, etc. You can trap furs—we teach you how. **Funsten Animal Baits** guaranteed to increase your catch. $1.00 a can postpaid. The **Funsten Perfect Smoker** "smokes 'em out." Price $1.50; parcel post 30 cents extra. Both guaranteed satisfactory or money back. **Traps at factory prices.** **FREE** 3 books in one (trapper's guide—game laws—supply catalog) Tells how, when, where to trap, how to remove, prepare and ship skins. Will send you fur market reports, shipping tags and big book **FREE**—**Write today. We tan hides and furs for coats, robes and garments.**

Largest in the World in Our Line

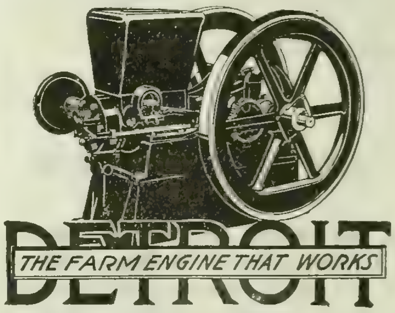
FUNSTEN BROS. & CO., 729 ·Funsten Bldg., ST. LOUIS, MO.

ABSORBINE
TRADE MARK REG.U.S.PAT. OFF.

Removes **Bursal Enlargements, Thickened, Swollen Tissues, Curbs, Filled Tendons, Soreness from any Bruise or Strain;** Stops Spavin Lameness. Allays pain. Does not Blister, remove the hair or lay up the horse. $2.00 a bottle, delivered. **Book 1 K free.**

ABSORBINE, JR., the antiseptic liniment for mankind. For **Synovitis, Strains, Gouty** or **Rheumatic deposits, Swollen, Painful Varicose Veins.** Will tell you more if you write. $1 and $2 per bottle at dealers or delivered. Manufactured only by **W. F. YOUNG, P.D.F. 134 Lymans Bldg., Montreal, Can.**
Absorbine and Absorbine, Jr., are made in Canada.

Only $12.35 per H. P.
THIS ENGINE


DETROIT
THE FARM ENGINE THAT WORKS

Built and guaranteed by the largest producers of farm engines—a regular glutton for work—simple, durable, powerful—four cycle, suction feed, make and break ignition—every part interchangeable—fully tested. Guaranteed to Develop Rated H. P.
SAVES FUEL, TIME, LABOR, MONEY
8 Horsepower Detroit only $98.75
Can you beat that? Write for big illustrated Engine book to-day
Full Line Detroit Engines 1½ horsepower up
DETROIT ENGINE WORKS 299 Bellevue Ave., Detroit, Mich.

Better Butter—
Bigger Profits!

If you wish your butter to be smooth and uniform, use the

"BRITISH"
Butter Worker

Adopted by the best dairies in Gt. Britain and Canada. Makes the butter firm-even-consistent all through. Results in better butter and bigger profits!

Sold by dealers everywhere.
Three sizes — 14 in., 17 in. and 20 in. wide.

MAXWELL LIMITED, St. Mary's, Ont. 4

AA

The JOURNAL of AGRICULTURE

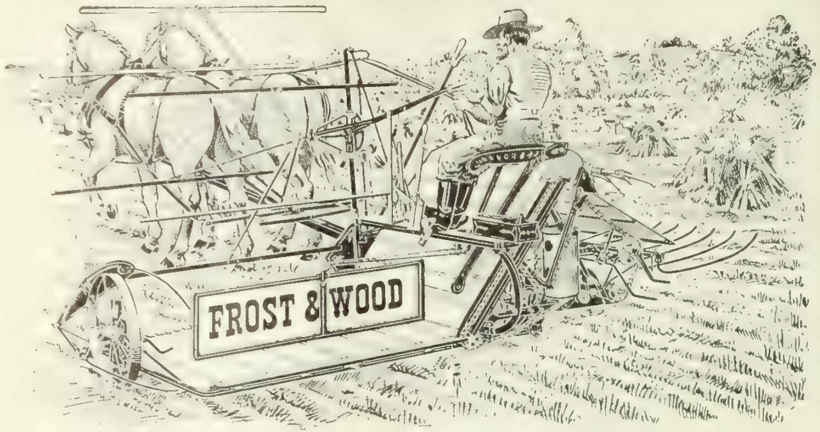
AND HORTICULTURE

Volume 19 February 1st 1916 Number 8

Practical Instruction in Home Dairying Receives Attention at Macdonald College

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

Buy Your Binder RIGHT



The most important implement investment any farmer can make certainly is his Binder, and right there, because thousands of farmers realize that fact, you have the reason for the tremendous popularity of the

Frost and Wood Binder

THIS is the Binder noted for its light draft — its sure, speedy cutting — its great strength — its ease of handling. But the greatest of all its assets is Reliability. This comes from long Frost & Wood experience in the development of the Binder. It comes from many stringent tests we give every F. & W. Binder before it goes to the customer. The Frost and Wood Binder has a big power wheel of special design, special roller bearings, special cutter bar, special non-failing knotter, special non-clogging elevator and other exclusive features too numerous to list here. Frost and Wood make the Binder you can buy and KNOW it will give you the field service you want in any emergency.

Roller Bearings
Swift Cutting
Cuts any Crop
Sure Tying
Light Draft
Special Rollers
Easy Levers
No Threshing
No Choking

Write nearest Branch or Office for Frost and Wood Binder Book and see what a splendid machine it is.

The FROST & WOOD Company, Limited
Montreal, SMITH'S FALLS, St. John.

DU PONT FABRIKOID

MOTOR QUALITY

The Standardized Automobile Upholstery

DU PONT Fabrikoid, Motor Quality, is used on more than half of all 1916 automobiles.

Several years' use on hundreds of thousands of cars has proved its superiority over coated splits, commonly called "genuine leather."

Popular motor car prices are low because every detail of their manufacture is of *standard guaranteed* quality and cost.

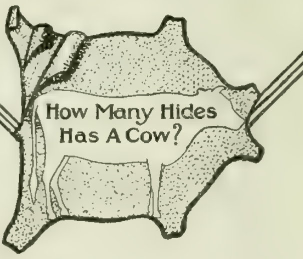
Coated splits, weak and irregular in quality, durability and price, cannot be standardized.

Motor Quality Fabrikoid, uniform in quality, price, durability and handling costs, *is* standardized.

Insist upon Fabrikoid upholstery. Buy a standardized car and get the most for your money.

Send for samples and booklet No.

DU PONT FABRIKOID COMPANY
Wilmington, Delaware
Factory at Newburgh, N. Y.
Canadian Sales Office, Toronto


How Many Hides Has A Cow?

Your Cows Will Give More Milk

SUCCESSFUL dairymen have proved that stall-fed cows produce more milk when given a balanced ration containing the proper amount of protein.

Home grown feeds lack the necessary amount of protein —your stock may be well fed and still be unprofitable.

S-W. Screw Process Linseed Meal

is guaranteed to contain 36 per cent. of protein. Mixed in the proper proportion with home grown feeds, it will increase the milk production of your cows to a greater extent than bran or mixed feeds.

S-W Linseed Meal is always fresh, rich and makes the feed more palatable.

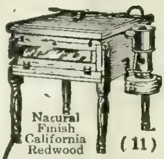
Write for prices and our free Booklet, it tells how to feed all of your stock economically and profitably.

THE SHERWIN-WILLIAMS CO., LIMITED,
891 Centre Street, Montreal.

ARE THE BEST MONEY CAN BUY

SEED CORN: Best Flint and Dent varieties for either crop or silo. Canadian grown and will give the largest amount of well matured corn to the acre. Germination tests to date average over 95 per cent.
ALFALFA, CLOVER, AND TIMOTHY: One grade only, the best obtainable. Send for samples.
REGENERATED SEED OATS: Six splendid varieties. Early and very productive, with grain weighing 40 lbs. and over per bushel. Free of wild oats and noxious weed seeds as defined by the Canadian Seed Control Act.
MARQUIS WHEAT: Winner of $1,000 prize given by Sir Thomas Shaughnessy at the New York Show for the best wheat grown on the Continents of North and South America.
SWEDE TURNIP—*Ne Plus Ultra*: Is the new world famous Turnip, and recommended by Agricultural Colleges as being the best cropper, the best shape and keeper. It is the highest quality swede in cultivation. Dupuy & Ferguson's 1916 *Seed Annual Sent* FREE for the asking.

DUPUY & FERGUSON,
38 Jacques Cartier Square, - Montreal

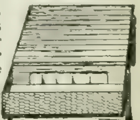


130-Egg Incubator and Brooder Both For $13.90

FREIGHT AND DUTY PAID

(11) If ordered together we send both machines for only $13.90 and we pay all freight and duty charges to any R. R. station in Canada. We have branch warehouses in Winnipeg, Man. and Toronto, Ont. Orders shipped from nearest warehouse to your R. R. station. Hot water, double walls, dead-air space between, double glass doors, copper tanks and boilers, self-regulating. Nursery under egg tray. Especially adapted to Canadian climate. Incubator and Brooder shipped complete with thermometers, lamps, egg testers—ready to use when you get them. Five year guarantee—30 days trial. Incubators finished in natural colors showing the high grade California Redwood lumber used—not painted to cover inferior material. If you will compare our machines with others, we feel sure of your order. Don't buy until you do this—you'll save money—it pays to investigate before you buy. Remember our price of $13.90 is for **both** Incubator and Brooder and covers freight and duty charges. Send for FREE catalog today, or send in your order and save time.

Write us today. Don't delay. WISCONSIN INCUBATOR CO., Box 214, Racine, Wis., U. S. A.



ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE
AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 93,634
ENGLISH, 9,820
FRENCH, 83,814

Volume 19
FEBRUARY 1st 1916
Number 8

EDITORIAL

PROGRESS OF AGRICULTURE IN QUEBEC

At the recent Dairy Convention held at Farnham the Hon. Mr. Caron, Minister of Agriculture, reviewed the progress of agriculture in the Province of Quebec. His address is worthy of careful study, especially by those who do not keep in touch with recent agricultural doings and who are apt to belittle the excellent work that is being done by the Department and the other agencies under its supervision. We shall refer to a few outstanding achievements.

Mr. Caron showed by statistics that the products of the farms have increased very materially during the last five years. From 1908-1912 the average value of the farm products was 85 millions; in 1913 it was 88 millions; in 1915, 95 millions. The Province spent four millions in 1915 and 11 millions in the last three years on good roads which are of fundamental importance in the advancement of agriculture. This work will be continued until good roads exist throughout the Province.

The development of the dairy industry in Quebec is nothing short of marvellous. In 1871 there were 25 cheese factories; two years later there were 162 butter and cheese factories; in 1891, 728; in 1901, 1992; and 2142 in 1911. The value of the dairy products rose from $124,000 in 1871 to $16,157,000 in 1911. During the ten year period, 1901-1911, the increased production is seen in the fact that while each patron received $109 in 1901 he received $179 in 1911.

The Minister takes a very cheerful and hopeful view of the operations of the new law regarding inspection of factories. Under the old law the inspectors were paid entirely by the makers, some paying more than others, and difficulty was found in bringing about needed improvements. Under the new law the inspectors are free to make impartial reports since they are no longer paid entirely by the factories, each factory now contributing the same sum. Under the old law each factory paid $40 for inspection but only 1800 out of 2800 factories paid the fee and belonged to the Syndicate. Under the new law the fee is $15 and all the factories are subject to inspection. The duty of the inspector is now to see that the factories are doing good work; they are relieved of the work of testing milk and of making cheese and butter. The large number of prizes awarded Quebec makers in 1914 and 1915 at the Toronto Exposition is convincing evidence of the superior training of the makers and of the system under which they work.

The Co-operative Society of Cheesemakers continues to do magnificent service for the dairy industry of the province by classifying the products, and going to the source of any evil and improving the product.

The Co-operative Society has lately enlarged its field of operations and has undertaken the sale of poultry, eggs and bacon. A strong effort is now being made to get the farmers to produce bacon hogs, and there is every prospect of abundant success.

The Minister concluded his admirable address by referring to the fine work of the agricultural Colleges in the preparation of young men for the agricultural profession, and to the excellent results of the recent Short Courses given in various parts of the Province.

RURAL CREDIT SYSTEMS

The establishment of a rural credit system has its difficulties, and as yet we have seen no system devised that meets the situation satisfactorily. Our present banking system is purely commercial, and its policy is to help those industries that are able to make quick returns. This is business that is perfectly legitimate, provided speculation is strictly prevented. Loans to farmers are not looked upon with favour, not because they are insecure but because they are taken on "long term" payments, and sometimes hard to convert into cash.

From the farmer's standpoint, however, this is not the real objection to the present system. Even if he could get all the money he required at current rates and on long terms he would not in every case be justifed in borrowing money at five per cent interest. Let us take a case of a young well trained farmer borrowing money to buy a well equipped farm costing, say, $10,000. If legitimate farming under the best of conditions rarely pays five per cent net how can this man ever hope to free himself from his burden? Inasmuch, however, as land is as good security as a government bond there should be some means of borrowing money at a low rate of interest and on a twenty or twenty-five years' term of payment. But is is just as well that banks are not allowed to lend money on real estate as security. The time would soon come in all probability when the land would be grouped into large estates and a peasantry system established such as exists in many parts of Europe.

Our present banking system, constituted as it is, does not serve the interests of the farmer. Another system is wanted that will meet the farmer's needs, but the question is — How is this system to be established and maintained ?

The German, Danish and other systems have not been unqualified successes, and our population is too mixed and suspicious to stand security, the one for the other.

This province was among the first to start Co-operative Loan Societies among the farmers themselves. Considerable success has attended the efforts, and it would seem that this plan is at heart sound. The only practical difficulty is in getting farmers to co-operate fully and without suspicion.

The newspapers report that Manitoba is about to try the plan of County Banks similar to those in many of the States. The details, however, have not yet reached us, so we are unable to make any comment, favourable or otherwise.

Several of the States have credit systems that are giving fair satisfaction; these are based more or less on the Raiffeissen system in Germany. Perhaps the latest attempt to provide money for farmers at a low rate of interest and a long term is that of New York State. Two or three years ago the Legislature established by act the New York State Land Bank through the efforts of ex-Gov. Glynn. Farmers borrowing money are required to associate themselves with some savings or loan association. When an association deposits mortgages with the State Comptroller money is advanced by the State Land Bank to be repaid by instalments at times and in amounts agreed upon. The Land Bank issues bonds to cover the amounts loaned to the Associations. It is a co-operative institution organized and managed by savings and loan associations. Although the plan has been in operation but a short time many farmers, it is said, have already taken advantage of it, and borrowed money on very reasonable terms.

WHAT THE LEADERS ARE SAYING AT BIG CONVENTIONS IN ONTARIO

January is the month of big conventions of farmers in Ontario, where Dairymen, Live Stock men and others meet to discuss problems that arise in their special fields.

One of the live questions with Ontario dairymen is whether cream and butter grading should be adopted. The quality of Ontario creamery butter is not satisfactory, and on the whole is inferior to that from Quebec and other provinces. The Government experts were very emphatic and outspoken in their remarks, and urged that cream be graded and paid for according to quality at the creameries.

Cow-testing is making headway, and the recent marked improvement in the dairy herds of the province is due largely to the weeding out of inferior animals. Mr. Whitley's remarks on this subject will be found in another column.

At the Experimental Union meeting at Guelph, Professor Zavitz said that there are too many varieties of grain sown. Better results would be secured if only the best varieties were planted. This warning would apply equally well for Quebec.

Seed Commissioner Clark pointed out that there is a lack of grass and clover seed for 1916. While the alsike crop of seed was normal, that of red clover and alfalfa was very light. The potato crop of 1915 in Ontario, too, suffered severely from blight and rot, and if the season of 1916 turns out wet there is a strong probability that the crop will suffer even more severely than last year's.

CONTENTS

EDITORIAL:—Progress of Agriculture in Quebec. — Rural Credit System. — What the Leaders are saying at big Convention in Ontario. — District Representatives' Work. — Aid to Agricultural Colleges and Schools.

ORCHARD AND GARDEN: — Hot Beds and Cold Frames.—What may be grown in Hot Beds.—A Trip to the British Columbia Coast.

FARM AND FARM CROPS:—Short Courses in Agriculture.—Ice Supply for the Farm.—Corn Varieties for Quebec.—Saving the Fertility. —Turnip Harvesting. — The Missisquoi Plowing Match. — Seed Grain. — Simple Concrete Step Construction.

LIVE STOCK:—Care of the late Winter or early Spring Litter.—Some Flocks, Herds and Farms of the Bedford District.—Fall Trade in Hogs.—The Champion Dairy Cows of Canada.—Feeding Hogs for Market.—What is Bacon ? —Veterinary Questions.

DAIRY: — Pasteurised Milk.—Milk; the Problem and its Solution.—The Milk House. — New Possibilities in Dairying.

POULTRY:—Short Course in Poultry Raising. —Feeding the Laying Stock.—Quebec's Opportunity in Poultry Raising.

WOMAN'S WORLD: — Travelling Library of Quebec Homemakers' Clubs. — The Care of Gold Fish.

GENERAL INTEREST:— Precedents. — Preparedness.—Sunshine a Germicide. — What Hinders Profit in Dairying.—The Strong Points of Live-Stock Breeds.—A Story with a Moral.—The Modern Rural School.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

FULL SPEED AHEAD.—He was the slowest boy on earth, and had been sacked at three places in two weeks, so his parents had apprenticed him to a naturalist. But even he found him slow. It took him two hours to give the canaries their seed, three to stick a pin through a dead butterfly, and four to pick a convolvulus. The only point about him was that he was willing.

"And what", he asked, having spent a whole afternoon changing the goldfishes' water, "shall I do now, sir?" The naturalist ran his fingers through his locks.

"Well, Robert", he replied at length, "I think you might now take the tortoise out for a run". —*Christian Register.*

Mr. Dymond of the Seed Commissioner's laboratory, Ottawa, called attention at the Guelph Winter Fair to the danger of introducing new weeds into the farms of Eastern Canada from the West through the medium of bran, shorts and chop, especially the latter. Farmers should be careful to get their supplies of chop from reliable dealers whose names can be secured from the Inland Revenue Branch, Ottawa. They may also send samples to the Seed Laboratory for analysis.

Prof. G. E. Day of the O.A.C., gave some valuable advice at the Winter Fair on the Feeding of Hogs for Market. He said it never pays to keep hogs on a maintenance ration and then finish for market by heavy feeding in the last few weeks. In view of the prominence that is being given to bacon production in this province we are publishing the gist of Prof. Day's remarks in another column.

Mr. J. J. Ferguson of Swift's, Chicago, spoke on the "Marketing of Live Stock" at the Winter Fair, Guelph, and strongly urged the feeder to provide what the market wants. A well trimmed steer weighing about 1000 lbs is a much better paying proposition than a heavy fed ox weighing 1500 or 1600 lbs. The Commission man can sell the beef to better advantage than the feeder, but the feeder should go into the market and see the sale. In this way he learns much about market requirements.

Mr. H. S. Arkell, Deputy Live Stock Commissioner, Ottawa, at the same meeting called attention to the great demand for mutton and lamb. He thought that the sheep was the most profitable animal on the farm at the present time.

At the Eastern Ontario Dairymen's Convention, J. H. Grisdale, Director of the Dominion Experimental Farms, said he had lately travelled from the Atlantic to the Pacific and back, and had never before seen crops so good in all parts of Canada. This, he held, could be repeated every year in Canada by proper crop rotation. "We could guarantee to this eastern part of Canada," he declared, "such an area of prosperity as it has never before seen in the whole Dominion if everyone would set to work to produce all he could raise by a proper rotation of crops and follow it up." Referring to the building up of herds, he thought that farmers could more safely buy a pure-bred bull and start to gradually work upwards than jump at once into the pure-bred line.

DISTRICT REPRESENTATIVES' WORK

AMONG the activities promoted and encouraged by The Agricultural Instruction Act, now in its third year of operation, having come into force in June, 1913, as detailed in the Report recently presented by the Commissioner of Agriculture, and which can be had on application to the Publications Branch, Ottawa, there is none that exceeds in influence and usefulness the work done by the District Representatives. Their duties are manifold and unceasing, but their helpfulness in the agricultural industry is abundantly testified to in every district where they have been appointed, and there are now 45 of them in Ontario alone. It is theirs not only to be ever ready with counsel and advice on farming subjects but also to manifest a live and active interest in every undertaking having for its object the better cultivation of the land, the increase of productiveness, the development of the live stock industry, the improvement and extension of educational facilities, the social uplift of the people and the welfare of the agricultural community generally. In short their usefulness can hardly be over-estimated, and towards their support the funds forthcoming from the ten-million dollar grant provided to be distributed among the provinces during a term of ten years under The Agricultural Instruction Act, is largely devoted. All this is fully detailed in the Report of the Commissioner previously referred to and which affords instructive reading. Taking the provinces separately we find that the amounts directly utilized for this purpose in 1914 were:

Prince Edward Island	$ 4,000
Quebec	10,000
Ontario	80,000

In most of the other provinces the system has not yet been organized under the title of District Representatives, but in all of them the funds allotted find a somewhat similar disposition in furnishing means for the promotion of demonstration work. In Nova Scotia $4,200 was so employed in 1914 and in New Brunswick $14,200 under the title of travelling instructors. In Manitoba upwards of $30,000 of the grant of $51,720 was disposed of by means of demonstrations. In Saskatchewan $27,148 and in Alberta $14,594 practically went the same way. In British Columbia $27,500 was devoted to demonstration work. In Prince Edward Island, Quebec and Ontario besides the amounts mentioned as directly used in the maintenance of the District Representative system substantial sums were also supplied to demonstration purposes.

AID TO AGRICULTURAL COLLEGES AND SCHOOLS

THE grants under the Agricultural Instruction Act being supplemental to those from provincial and other sources make many things possible that otherwise would be considered impracticable by reason of the expense involved. In particular are they valuable in the prosecution of the higher education in agriculture. By the help of these grants not only are agricultural colleges and schools made more efficient in equipment, but it is made possible to pay men of first class information and experience salaries becoming to their station. Further, graduates who have passed with honours and obtained degrees in our own colleges and universities are induced to stay in their own country rather than to go abroad in search of remuneration to which their ability entitles them. Indeed several good men have already been repatriated and have accepted lucrative engagements in the land of their birth. How far the funds are being used in this direction is indicated by the following appropriations made from their allotments for 1915-16 by the different provinces immediately for schools and colleges, apart from extension work, short courses, demonstrations, etc:

Prince Edward Island	$10,050
Nova Scotia	27,500
New Brunswick	16,500
Quebec	60,000
Ontario	93,813
Saskatchewan	22,800
Alberta	38,000

Manitoba and British Columbia apply portions of the fund in a similar way but through the public, normal and high schools, and thus the grants appear under another heading than agricultural schools and agricultural colleges.

To the village clergyman's home there came one day a bouncing baby boy. Kind neighbors and members of his flock hastily gathered together a few dollars and presented the money to the proud but poor father.

So great was his gratitude that he decided to thank his congregation the following Sunday before beginning his sermon, and this is what the wondering congregation heard:

"Friends, I want to express my keen appreciation and gratitude for the timely little succor that came to my home yesterday".

THE GARDEN AND ORCHARD

HOTBEDS AND COLDFRAMES

THE period of warm weather in Quebec being very short in comparison with the length of life of some of our best vegetables, it is necessary for us to have them in an advanced stage of growth before setting them in their permanent quarters in the field.

To overcome this difficulty it is necessary to use hotbeds and coldframes. A hotbed is made the same way as a cold frame with the addition of manure to furnish heat, and is used for the first starting of the plants.

Hotbeds may be made wholly above ground or in pit form with the manure below ground level. The first is the simpler method, but for more permanent work the below level bed will give the best satisfaction. The pit is made 18 inches deep and of the size of the frame which is to be placed over it. All beds should be on the south side of a building or wind break to protect it from the cold north or northwest winds.

Pit Hotbed.

One or two loads of manure should be enough for a two sash frame. This should be fresh horse manure from highly grain fed animals. It should contain only about one-fourth of its bulk of straw and this should be short. When obtained it should be carefully piled so that it will start to heat. When steaming it should be carefully turned inside out and allowed to again heat. When steaming the second time it is ready for use. If we are using a surface bed the manure should be spread in layers six inches thick and one foot larger every way than the frame which is to be laid on it. After carefully tramping and leveling this layer, the next is put on and as carefully handled. The height of the pile of manure depends on the season. If early March, it should be two and one-half feet deep, in April, from one foot down to six inches. Then the frame is placed on and from four to six inches of soil. A thermometer is placed in the soil and the glass put on. The frame is generally made of one inch lumber, the back being eighteen inches, the front twelve inches high. This gives the needed slope to the glass to shed rain and allow all light possible to enter. The pit hotbed is made similarly except that the manure is below the ground level. The frames should be well banked with hot manure. When finished the temperature of the bed will rise rapidly to about 120° F. Seed should not be sown until this has fallen to about 90° F. Each day the glass should be opened to permit any noxious gases which have come from the manure to escape.

Hotbed above ground level.

In sowing the seed, rake the soil level and free from clods then sow the seed in rows three inches apart and about one quarter inch deep. Sow the seed by hand and then cover lightly with earth or sand and give a careful watering.

After sowing the seed the bed must be given careful attention as to watering and ventilation. Water sparingly and only on bright days. Water with a can with a fine spray in the morning as the plants need it. Ventilate whenever possible but always have the opening away from the wind. On bright days open from two to three inches, on dull stormy days slip a small lath under the frame. Have them ventilated during the middle of the day. Experience will be the best teacher. Do not allow cold air draughts to strike the plants. Always ventilate the plants after watering to prevent scalding.

A cold frame is used mostly for hardening the plants grown in the hotbed to field conditions and temperature, before setting them out permanently. They should be handled like the hotbed as to watering, but more ventilation is given until finally all covering is removed the last few nights before setting in the field.

A. H. MAC LENNAN.

WHAT MAY BE GROWN IN HOTBEDS

THE most common use made of hotbeds in this province is for the production of early tomato, cabbage, cauliflower, celery and melon plants. One small hotbed will do in which to grow all these young seedlings except the melons. From this they can be transplanted to lighter hotbeds or cold frames, if the season is advanced. Early cabbage, cauliflower and celery are usually given but one transplanting, two inches apart each way, but tomatoes, if we would produce early bearing plants, should be given two transplantings two inches apart each way the first time and four inches each way the second, or into old quart berry boxes. This latter is found most satisfactory for field transplanting. Melon plants should be grown in a hotbed alone in either five inch pots or berry baskets, and they require moister atmospheric conditions to grow well.

Young plants in flats in light hotbed.

Light hotbeds may also be used for growing early lettuce, spinach and other early plants before it is possible to start them in the field. These are generally allowed to fully develop here, though some of the young lettuce plants may be transferred to the field as soon as the weather permits. Beet seed may also be sown and transferred to the field after one transplanting in the hot bed. This gives us much earlier bunch beets.

In some sections onion seeds of either Prizetaker or ordinary types are being started in a light hotbed about a month before planting time, and are set out in the field from two to six inches apart in the rows, depending on the variety and the size desired. The cost of transplanting is about equal to the thinning and weeding of a seed sown patch; afterwards the spent beds are often used to grow muskmelons and cucumbers. Few seeds are planted under each sash, and the plants later thinned out to two.

A. H. MACLENNAN

A TRIP TO THE BRITISH COLUMBIA COAST

A Paper read by Robert Brodie Esq. Westmount, at the Summer Meeting of the Quebec Pomological Society at Ste Anne de la Pocatière, Sept. 24th 1915

WE may read about this great Dominion of Canada of ours, with its immense natural resources, its wonderful productiveness, but we can only realize the vastness, the immensity of it all, by taking a trip over it and seeing for ourselves.

The size of the country is best described by a young Scotchman who took up land in the West, and as with most of that race prospered remarkably well. He took a trip home to Scotland to see the Old Folks; they were amazed at what he told them about the size of Canada. He said: "Fancy being on a train for five days from Montreal to Vancouver, eating your meals on the train, sleeping also, and in motion all the time, with the exception of the short stops at the different stations; this will give you an idea of the size of Canada." His mother said: "Sandy, I'm feart you are telling lees (lies) to your auld mither."

We left Montreal the 18th. of July 1914 by C. P.R. for Toronto, arriving there in the morning. We spent a few hours driving around the residential parts, which were beautiful, especially Rosedale with the size of its well kept grounds, its flowers and ornamental trees and shrubs. — At noon we took the train to Port McNichol which we reached about 5 p.m. and got on board the C.P.R. palatial steamer Assiniboine, with its obliging staff of officers and crew. The boat left as soon as the passengers were all on board. After dinner we went out on the after-deck and enjoyed the sail through the Georgian Bay; it felt as if we were on the sea with the hundreds of sea gulls that followed the boat to eat the leavings from the dining tables that were thrown overboard by the sailors.

Next day about noon we reached Sault Ste. Marie, connecting Lake Huron and Lake Superior. Sault Ste. Marie is a large manufacturing centre with immense iron and steel works and the shipping which has to go through the locks. Now we enter Lake Superior, the largest and deepest body of fresh water in the world; it was as calm and quiet as a mill pond when we sailed through it. We did not realize that a few months afterwards there could be such a storm, such wrecks and such loss of life.

What impressed me most about the fertile soil and immense productiveness of the Great West was the large number of grain-laden boats, almost a procession, each holding from 250,000 to 500,000 bushels of wheat, and to think that there are millions more acres of such lands available; Canada may well be called the granary of the Empire.

On Monday, July 21st., we passed Thunder Bay and entered the picturesque harbor of Port Arthur, and a litle later to our landing place; Fort William. These two places might be called the twin cities of the north, being the Canadian terminals of all the boats connected with the different lines of Railways in Canada. The future of these cities will soon compare with Chicago.

We left Fort William about 9.30 a.m. and journeyed all day through scenery composed of lakes, rocks and evergreen trees, (or, as someone on the train called them, Christmas trees). We reached Winnipeg about 6.30 p.m. and put up at the Royal Alexandra Hotel, one of the C.P.R's beautiful and commodious hotels. It seems only a few years ago that Winnipeg was old Fort Garry, a Hudson Bay post; but now it is the third largest city in the Dominion. A beautiful hotel built by the Grand Trunk Pacific Railroad is on the site of the old Fort.—We admired the city's broad streets, well kept grounds and parks, although I missed our stately elms and beautiful sugar maples; still they made the best of what they had and the residential parts were really very fine. The banks, stores and warehouses reminded me of Montreal, for a good many of them had the names of Montreal firms, and we were glad to meet old friends and talk over old times.

We left Winnipeg in the evening on the "short route" to Edmonton; this line ran through a comparatively new country, compared with the more southern main line. The scenery was mostly prairie, wheat fields and alkali lakes till we came to Saskatoon, a baby town only five years old with a population of 4,000, a trolley car system, a University, an Experimental Farm, and with two or three lines of railways. It seemed marvellous for this place to grow up in such a short time; I suppose the main cause for this rapid development is that it is in one of the finest wheat growing regions of the West.

We reached Edmonton Thursday morning; after two nights on the train we were quite ready for a rest. We liked Edmonton with its rolling landscape, wooded hills and the swift flowing Saskatchewan, for it reminded us of an eastern city. The soil of the surrounding country is very rich and will grow almost anyhting. It is a great grazing country and some of the fattest cattle I have seen anywhere were on one of the farms. They have a species of pea vine growing wild that makes very nourishing food for cattle. Coal is very abundant around Edmonton, and I think the outlook for the future is very promising, for all the products of the Peace River district will have to go through this city. All these cities in Manitoba, Saskatchewan and Alberta will, however, have to depend on the other Provinces for most of their fruits, especially apples, pears, peaches and plums.

We left Edmonton on a Sunday evening on our way to Calgary, then on to the Rocky Mountains. Our first stop was at Banff, the Beautiful, a very charming little town situated in the Bow river valley, on the eastern slope of the Canadian Rockies. At the meeting of Bow and Spray rivers, the C.P.R. has a large and well equipped hotel which commands a view of the peaks and stretches of the Rockies in all directions. A famous explorer and mountaineer says: "The vast ranges are appalling in their immensity and grandeur, for here are fifty or sixty Switzerlands rolled into one." We left next morning for Laggan and Lake Louise and the lakes in the clouds at an altitude of 6820 feet. On the shores of Lake Louise there is a handsome chateau, and from there we took trips to the most enchanting spots in the Rockies. However, I must not take too much time trying to describe the beautiful scenery and grandeur of it all, for I know you all want to hear about the fruit sections we visited in British Columbia.

We left Lake Louise in the morning and travelled all day through the Kicking Horse Pass, through spiral tunnels and past Glacier with its immense mountain of ice, till we arrived in the evening at Sicamous Junction where we got off to stay overnight and to take the train next morning for our trip down the Okanagan.

Sicamous on Shusway Lake is called the hunter's paradise, but when we arrived there the mosquitoes were the hunters, and the people were going around with netting over their heads.. It was a great change in the temperature to leave glaciers in the morning and to find it 86° in the shade in the evening. The C.P.R. hotel at Sicamous was very comfortable and the superintendent and staff were very obliging.

We left there in the morning and transferred onto the boat at Okanagan Landing. The sail down the lake was beautiful; occasionally we would meet a boat towing a barge containing four cars of fruits. These cars were run onto the tracks at Okanagan Landing whence it is a day's journey to Calgary in the East or to Vancouver in the West. We thought it a slow way of shipping perishable fruits. The railway runs through a first class farming country in which are situated the towns of Mara, Armstrong, and Enderby where the rainfall is sufficient without irrigation. From Vernon southward, the climate is drier and irrigation is necessary on all bench lands, and where this is adopted bare hillsides are transformed into fruitful fields and orchards. What struck me as wonderful was that everything was young and vigorous in the orchard line compared with our old orchards 40 and 50 years old in the east.

Southern Okanagan with the Similkameen County to the West is destined to become the great peach and grape producing section of British Columbia. We spent a very pleasant time at Kelowna which is situated about midway of the length of the lake, along a two mile water front, and extends back for one mile and a half. The population is about 3,000. Here quite a number of Montrealers have invested in fruit lands. The country is beautiful and the climate is delightful. The average summer temperature is 76° and the average winter cold 12° of frost.

A friend motored us around through miles and miles of young orchards which were all making a vigorous growth. Our host drew our attention to a young man from Montreal, who was cultivating his orchard; the dust was rising behind him like that behind a motor car on a dusty road, however he seemed to be enjoying himself. There are some splendid irrigation plants around Kelowna. We measured the growth of a young branch of wood in the beginning of August, which was 3½ feet in length. We sampled some of the late sweet cherries, also early peaches, and they were delicious. We went through one of the packing houses, and in their busy season they pack four carloads a day. Tobacco is also grown quite extensively, and we saw 24 acres growing cotton, as is done down in Connecticut, U. S.

We left Kelowna in the morning by automobile, travelling through some of the finest young orchards one could find anywhere. They do not, however, confine themselves to fruit orchards, but also grow vegetables in abundance, especially tomatoes. On our way to Vernon we passed the far famed Coldstream Ranch which comprises 600 acres of apple orchard, and is the pioneer orchard of the Okanagan Valley.

In all the fruit districts we visited, I was impressed with the great care taken of the orchards. If we in Quebec would take as good care of our orchards as they do in British Columbia, we would get better returns than they, for we have a sea port and a large home market at our door. The trouble with our farmers is that dairying and mixed farming is the main thing, and the orchard is only a side issue, consequently it is left to the tender mercies of the caterpillar and other insects.

We spent a couple of hours in Vernon which is a beautiful city; it has a lovely situation on Okanagan Lake and is in a splendid ranching and fruit growing country. It is a thoroughly up-to-date town, with all the necessities of modern life.

We got back to Sicamous in the evening and left next morning for Vancouver. The railway is laid on the banks of the Thompson River till it joins the Fraser, then on to our destination. If I had to leave home and move to the West, I think Vancouver or New Westminster would be the place I would choose. The climate is like the south of England. The residential parts are beautiful; roses of all descriptions, English ivy, holly hedges, laurel trees, and fruits of all kinds made the homes very attractive. It was really the land of big things and very large trees. We were in a saw mill where the manager got his men to saw up a log 8 feet in diameter for our benefit.

It would take up too much of your time to describe to you the visit to the salmon canneries, our trip to Victoria and Seattle, to North Vancouver, Capilano, Canyon. We came home by the Arrowhead and Kootenay Lakes and the sail was lovely. As we were due in Montreal the 6th. of September, we had not time to see the fruit sections in these delightful places. After going through the Crow's Nest Pass in the Rockies, we joined the main line at Medecine Hat, and from there to Winnipeg; we went through immense fields of grain, principally wheat, prosperous cities like Regina, Moose Jaw and Brandon.

On our way home we stopped off at Niagara Falls. It is one of the places one never tires of seeing. It was the time of the peach harvest; such quantities everywhere! We covered most of the ground between the Falls and Hamilton, and we had to acknowledge that this was the garden of Canada.

When we got home, we drove up on top of old Mount Royal. It was a clear day in October; we could see the mighty St. Lawrence flowing fast on its way to the sea. Away to the east, across the fertile valley of the Richelieu, we saw the mountains of Beloeil, Rougemont and Yamaska on whose slopes are some of the best orchards; then to the south, across the valley of Chateauguay, where there are some of the best farms in Canada, we view Covey Hill with its vast orchards. To the west we have a grand view of the lake of Two Mountains region; on the banks of this lake are some of the finest residences and grounds I have seen anywhere, while on the mountain to the west nestles the Trappist Monastery with 600 acres under cultivation, where they make the world renowned Oka cheese; they have also the largest orchard in Quebec. With this great view before us, we thought "This is good enough for us; there is no place like home."

REGISTRATIONS TO AUGUST, 1915

THE number of pedigrees of cattle and horses registered with the Canadian National Live Stock Records from the inception of the system to August, 1915 were:

CATTLE	
Shorthorn	215,715
Ayrshire	54.178
Hereford	18,480
Jersey	6,051
Galloway	2,150
Aberdeen Angus	9,526
Guernsey	966
French Canadian	3,601
Red Polled	2,188

HORSES	
Clydesdale	52,681
Shire	2,272
Hackney	1,887
French Canadian	1,581
Percheron	9,383
Belgian	839
Standard Bred	1,861
Thoroughbred	1,824
Pony	991
Suffolk Punch	347
French Coach	104

The total number of swine recorded up to August this year was 134,569 and of sheep 131,564.

THE FARM AND FARM CROPS

THE SHORT COURSES IN AGRICULTURE

The Staff of Macdonald College carry the Gospel of Improved Methods among the Farmers of Quebec

(By our Special Reporter)

IN his utilization of machinery the farmer of this continent has been much more advanced than his European brother, for the high cost of labour has driven him to adopt every possible labour-saving device. But the problem of profitable employment of capital is not fully met by the purchase of machinery. By the use of improved stock, a proper study of the problems of feeding and fertilization, the introduction of a better rotation, and the growing of more remunerative crops, it is possible for the business farmer to considerably increase the interest on capital invested.

Such methods, however, not only make a great demand on the practical ability of the farmer, but also require on his part a certain amount of theoretical knowledge, if they are to be carried out with any degree of success. To meet the need of and demand for increased knowledge among the farmers of Quebec short courses have been arranged from time to time at Macdonald College, and also at various local centres in the province, and these courses have become an institution of great importance, here as in other parts of the agricultural world.

This year one-day courses were held at Chapeau, Shawville, Quyon, Lachute, Dundee Centre, Havelock, Clarenceville, Bedford, Sutton, Scotstown, Cookshire, Bishop's Crossing, Kingsbury, Ulverton, Coaticook, Waterville, Lennoxville and Ayer's Cliff. The officers who took part in the work were Professor H. Barton, A. A. MacMillan and A. R. Ness, of the Animal Husbandry Department; Messrs R. Summerby and P. A. Boving of the Cereal Husbandry Department; Messrs M. A. Jull, S. A. Bergey and A. G. Taylor of the Poultry Department; Professor T. G. Bunting of the Horticulture Department and Misses Hill, Campbell, Zollman, Philp and Mrs. Rutter of the Household Science staff. All these names are quite familiar to readers of the Journal, and it is not necessary to give a detailed report of the discourses; moreover, it is the intention of the Editor to ask these specialists to deal with their particular topics in separate articles.

The lecturers were on the whole well received, and your reporter took a great deal of pleasure in listening to the sound, practical advice and to the exchange of questions and answers between the audience and the lecturers, who were ready to give the best of their experience, while the audience in the majority of places visited was eager to receive information. A considerable difference, however, is observable in the attitude of farmers towards these meetings. In some sections men will come from long distances, over poor roads and in bad weather. They would not miss the opportunity for anything. In other sections the attendance is small, the questions few, and the general attitude more or less indifferent. And it is a peculiar fact that the attendance is best in districts where one would conclude from the general high standard of farming that the farmers would not need the information nearly so much as the men in districts where the attendance is generally speaking small.

Some men consider themselves on the way to success when they have a bank account on which they may perhaps draw 2½ to 3 per cent interest, and think that they have reached the height of financial success if they can place their money in a mortgage on an adjoining farm at 5 per cent. It might well be urged that in many cases the farmer instead of putting his money out at interest would secure greater returns by investing the sum to improve his own farm and its management.

If you want to know what short courses can do and have done in assisting a man to follow the right path, go down to Clarenceville in Missisquoi County and visit Mr. Clarence H. C. Hawley. Circumstances prevented this young and energetic farmer from taking an extended course at an agricultural college, but four years ago he saw his way to attend a 14 days' short course at Macdonald College, and he has since been present at the short course meetings in his home district every year. Since then he has, among other things, introduced a regular testing of his dairy cows, with the result that to-day his herd averages over 7000 lbs. of milk. He has built a silo, grows a good crop of corn and mangels every year, and has made a success of our most difficult and perhaps most valuable plant,—alfalfa. You may retort that he might have accomplished all this without attending any short courses. He might, and he might not. All I can say is that he himself gives the short courses a great deal of credit for his success.

P. A. B.

Mr. Clarence H. C. Hawley, Clarenceville, selecting mangels for seed-growing.

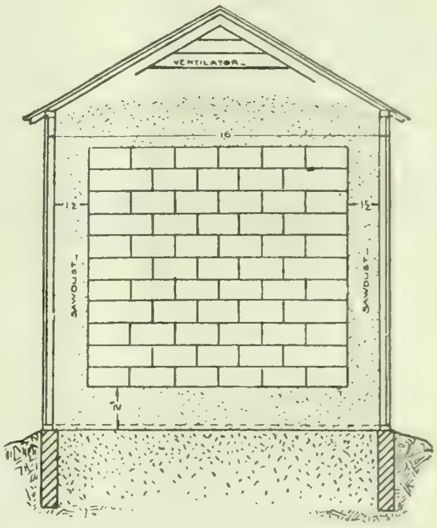
ICE SUPPLY FOR THE FARM

NO up to date farmer neglects to lay in a goodly supply of clean ice during winter for the summer months, and there is no excuse for the absence of a supply of ice as it can be easily procured from clean streams and ponds during February.

Ice is looked upon nowadays as a necessity and no longer as a luxury. It is a means of saving many perishable products during the warm days of summer. Besides, ice-cold milk and water and also eatables are both refreshing and satisfying.

There are many ways of storing ice, but it would pay the farmer to put up a permanent ice house. This house may be erected in connection with the milk house, but wherever it is it should be a substantial structure. The following hints are taken from Mr. R. R. Graham's bulletin on "Ice Cold Storage on the Farm". The essentials of an icehouse are there stated to be as follows:—

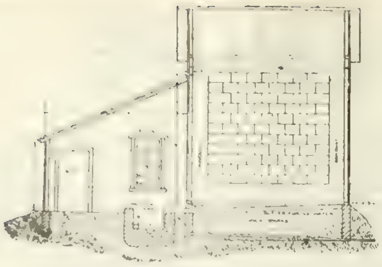
(1) *A favorable site.* This should be out of the sun as much as possible, and convenient to the house and the dairy.



Front view, in section, of ice house. The milk house is built in the form of a lean-to at rear.

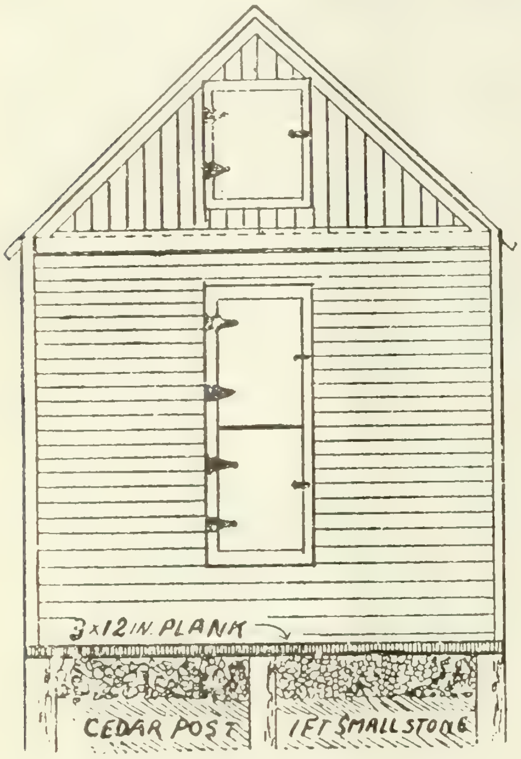
(2) *Adequate drainage.* If the ice-house is built on a loose or gravelly soil, natural drainage will be sufficient, but if on a heavy, compact soil, artificial drainage must be provided for as follows: Make an excavation the size of the inside dimensions of the house to a depth of eight or ten inches; below the bottom of this, and lengthwise, lay a row of three-inch tile at a depth of at least 1½ feet, and fill the trench with stones and gravel. The floor of the excavation should slope on both sides towards this drain so that all the water may get to it readily. Nearly fill the excavation with cobble stones, and finish with a layer of coarse gravel or cinders. The tile drain should lead to a good outlet, and the outlet should be well protected by some kind of screen.

(3) *Free circulation of air over the ice.* Provision should be made for the free circulation of air through the top of the ice-house, otherwise the enclosed stagnant air, becoming warm in contact with the hot roof in summer days, would conduct a great amount of heat to the ice below, and cause a big waste. This is a common neglect in the stor-



Sectional view of combined ice house and milk house. For ice house only the lean-to section and lower drain may be omitted.

age of ice. The remedy is to put a latticed opening or louvre in each gable and a ventilator on the roof. It is also advisable to leave the eaves open beneath, and the wall open for about 6 inches below the plate. By means of all these openings the air can pass through the top of the building, and yet no rain or storm can get in to wet the covering of the ice.



End view of ice house showing Foundation

(4) *Good insulation.* It is very necessary, in order to keep ice well, to surround it with plenty of some nonconducting material which can be readily obtained at a reasonable cost. The insulation of an ice-house consists of the wall itself and the packing about the ice; the chief function of the former being to ward off the direct rays of the sun and the weather and to check the flow of heat towards the ice; that of the latter to preserve the ice from direct contact with the warm air. Sawdust of a good quality, that is, dry and clean, is very satisfactory for packing around the ice; planer shavings are still better, but they are not always easily obtained, and they cost far more than the sawdust. Wild hay, straw and chaff may be used if nothing better is available. If sawdust is used there should be at least 1 foot of it well packed in between the mass of ice and the side walls, 2 feet under the ice and plenty of it over the top. As the sawust next to the walls settles, some of that on the top should be packed in from time to time. Wild hay is fairly satisfactory for covering the ice on top, being much used where sawdust is not very plentiful, but a greater depth of it is necessary. If plenty of packing material is used it is not very necessary to insulate the wall; two thicknesses of boarding with insulating paper between constitute a very good wall.

(5) *Banking.* The bottom of the house should be well banked with earth, or cinders, to prevent the warm air getting in beneath to melt the ice.

SIZE OF ICE HOUSE

It is usual to allow about 55 cubic feet of space per ton of ice. This includes the layer of sawdust which is used as an insulator. A house 12 x 12 x 11 feet will hold about 30 tons, and one 12 x 16 x12 feet about 45 tons of well packed ice. A good ice house can be built at a total cost of about $75.00, but if the farmer can provide most of his own lumber and is handy at carpentering the cost will be materially reduced.

HARVESTING THE ICE

It is always advisable that two or three neighbors co-operate in harvesting the ice as much saving of energy can be effected. The blocks should be of uniform size, cut with square faces as they pack better in the ice house. A convenient cake of ice is about 20 inches square and 1 foot thick, weighing about 150 pounds.

CORN VARIETIES FOR QUEBEC

Acreage of Corn not Increasing—Causes

In spite of the fact that the dairy stock of Quebec is increasing year by year the acreage of one of the cheapest and best feeds — fodder corn — is stationary or declining. The falling off in acreage is not taking place in the sections that have been growing corn extensively for a number of years as we find an increasing number of silos being constructed. The silo is also finding favor in localities where they have not formerly been used, and while we might judge thereby that the corn acreage was increasing, the acreage figures for the province show that there has been a decrease of 8000 acres since 1910.

Many farmers must for some reason be giving up corn growing after having tried it for a year or more.

While we believe that there is room for a very considerable increase in the corn acreage in Quebec it must be borne in mind that there are sections of this province which, on account of their climate, are not well adapted to its growth, and that efforts to grow it in such places must meet with disappointment. In other districts again it has been condemned unjustly without having been given a fair chance to demonstrate its value. At times it would appear that the corn crop suffers much at the hands of its best friends. While not overstating its advantages they frequently lay too little emphasis on the requirements of the crop, with the result that those beginning its cultivation neglect some essential. It may be that the most suitable land is not chosen for the crop, that sufficient manure is not applied, that an unsuitable variety is selected, that poor seed is planted, or that cultivation is not sufficiently thorough, the inevitable result being a poor crop.

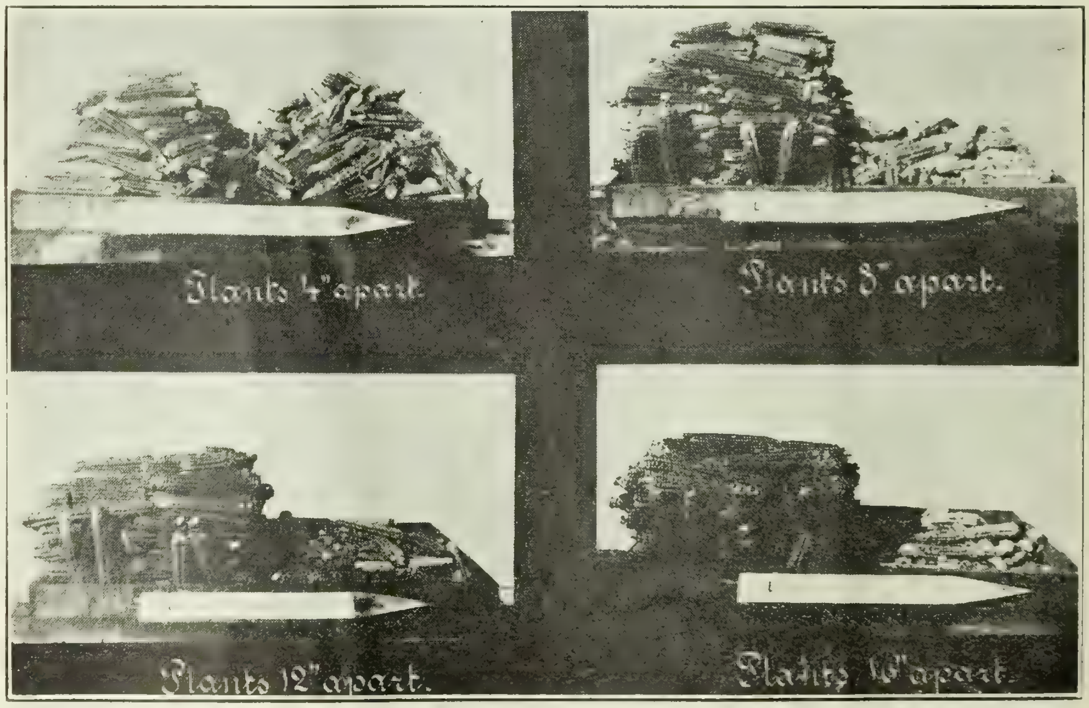
Conditions for Success

It cannot be too strongly emphasized that good crops of corn are not grown by accident. A well drained friable soil is essential. If it is not already rich in vegetable matter, a liberal application of manure is of equal importance, and no matter how rich it may be additional manure will prove beneficial. Thorough preparation before planting to destroy weeds and warm the soil is second only in importance to the cultivation while the crop is growing. As corn delights in a warm soil there is no advantage and considerable risk in sowing before it will germinate readily,—usually in this province from May 25th to June 5th. Seed of strong vitality is always important and many fields return only half a crop because this is neglected. Good seed on the cob can usually be secured at a trifling cost per acre in advance of the ordinary shelled kind, and if this be ordered early an opportunity is afforded to have it tested before sowing.

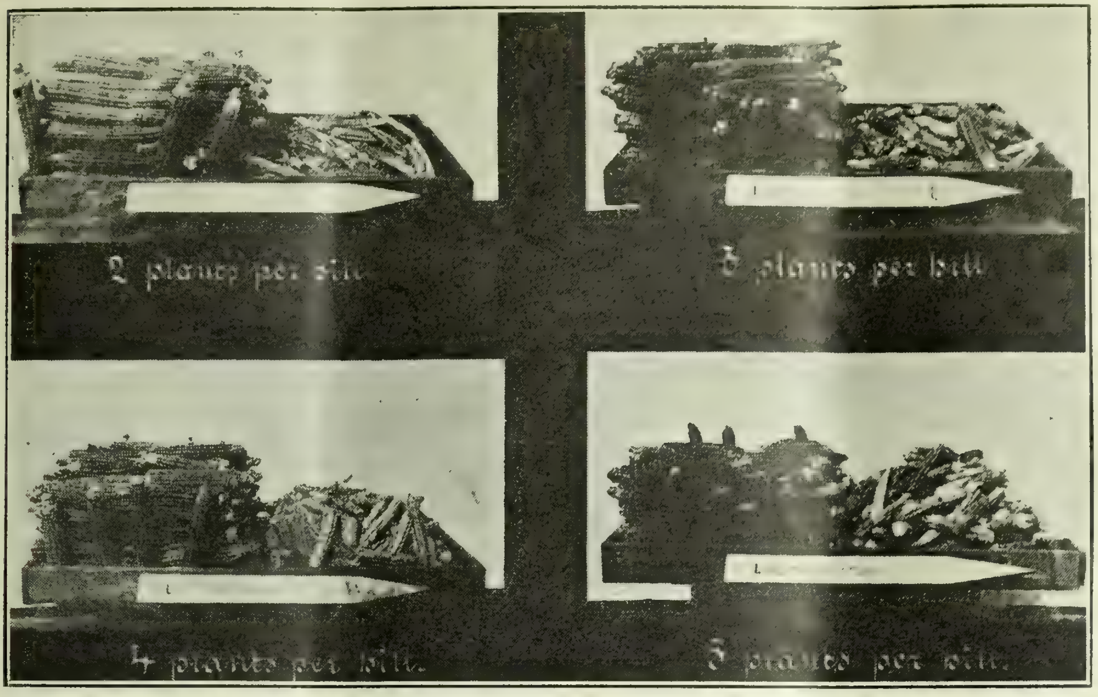
Even with a full stand of corn the yield will come far short of its possibilities unless cultivation during the summer months is given proper attention. Insufficient cultivation not only involves a loss in the tonnage of corn but also a loss in the yield of grain the succeeding year through the prevalence of grass and weeds. Corn is a cleaning crop only in so far as it is utilized for this purpose, and if cultivation is neglected one of the great advantages of the crop is lost. The cheapest and most efficient cultivation can be accomplished when the corn is planted in check rows as the horse cultivator can then be used in both directions. This eliminates the necessity of hand hoeing and accomplishes more by way of cleaning the land than where the corn is planted in drills and hoed once in addition to the row cultivation.

The Choice of Variety

On the choice of a suitable variety depends to a large extent the value of the crop. In the early years of corn growing in Ontario and Quebec the large late varieties such as Red Cob, Mammoth Cuban and Giant Southern Sweet, were grown extensively with the object of getting a high yield of fodder. No attention was paid to maturity as it was not appreciated how much the feeding value



Market ears left, nubbins right.—Experiments in rates of planting "Longfellow" Corn in Rows. 42 inches apart.



Market ears left, nubbins right.—Experiments in rates of planting "Longfellow" Corn in Hills. 42 x 42 inches.

depended on it. It is now generally recognized that in order to make the best quality of fodder a variety must be used that will approach maturity before cutting time. This is important not only on account of its containing more digestible nutrients, but also because it can be better preserved. Immature corn contains too much water and not enough sugar to make a good quality of silage, so that when taken from the silo the preserved product is sour. Sour silage was responsible in a large degree for the disfavor in which silage was held by many dairy companies some years ago. If immature corn be preserved as dry fodder there is a much greater percentage of loss in weight than if it be fairly ripe as the percentage of dry matter increases rapidly as the crop approaches maturity.

But in choosing a variety maturity is not the only consideration; yield is equally important. The aim should be to get the highest possible tonnage of feed of good quality. Yield per acre will vary greatly depending on the soil and the cultivation, and also too according to the locality. Varieties which give the most tonnage in one district will not necessarily be the best in one with a different altitude and on another class of soil.

Which varieties are best suited to the different parts of the province is a question that at present we are not able to answer other than in a general way. We know that Huntingdon and Chateauguay have a longer growing season for example than Richmond, Sherbrooke or Compton, and that in the former counties larger and later varieties of corn will succeed than in the latter. We know too that in Missisquoi for example, Longfellow and White Cap produce excellent crops, but we are not sure but that other varieties might do even better.

Experiments to Determine Best Varieties

In order to get definite information on this question the Cereal Husbandry Department of Macdonald College in co-operation with the Dominion Seed Branch and with the assistance of the College Demonstrators began a series of experiments in the spring of 1915. It was planned to test eight varieties each of which has given good results in some district and of which a good grade of northern grown seed can be secured every year. Tested seed of a common origin was used for all the tests and one eighth of an acre was planted to each variety. Seed was supplied for twenty-two tests and these were distributed over eight counties. An effort was made by the Demonstrators to locate the experiments with farmers who were interested in corn growing and thus insure their co-operation in making it a success. In the majority of cases the corn was planted in check rows with the hills three and a half feet apart each way, but this was impossible with a few experiments. Notes on the stand and the stage of maturity were taken just before the corn was harvested, and as it was cut part of each plot was weighed to get the yield per acre. In a few experiments owing to the lack of a scale the weight was estimated.

The varieties used were the following:—Bailey, Golden Glow, Wisconsin No. 7, Leaming, White Cap Yellow Dent, Compton's Early, Longfellow and North Dakota. We would not be justified in drawing any definite conclusions as to the best variety for each district from the experiments of one year, but a few comments on the results are in order.

In Richmond county two tests were satisfactorily completed, one at Kingsbury and one at Danville. All the varieties were too far from maturity to make the best silage, but White Cap Yellow Dent, Golden Glow and Longfellow, considering yield and stage of maturity were most desirable. Wisconsin No. 7, Compton's Early and Leaming were decidedly late. Four experiments were conducted in Compton County, but the weights of only three were taken on account of cut worms damaging one extensively. While good yields of fodder were secured, almost without exception the corn was in the early or late milk stage when harvested. On the whole the flint varieties showed up better than the dents while among the latter Golden Glow and White Cap were rather more advanced than the others.

In all four experiments in Huntingdon good crops were harvested in an advanced stage of maturity. The dents surpassed the flints both in yield and quality. In order of yield the varieties stood as follows:— Leaming, Golden Glow, Wisconsin No. 7, Bailey, Compton's Early, W. C. Yellow Dent, North Dakota and Longfellow. In Maturity the varieties varied somewhat on the different farms, but those most mature were Golden Glow, White Cap Yellow Dent, Bailey and Longfellow.

From the two experiments in Stanstead County we have no notes on maturity, the yields only being taken. The two heaviest yielders were Wisconsin No. 7 and Compton's Early, both rather late varieties.

In Missisquoi county three tests were conducted at Mystic, West Shefford and Cowansville respectively. In yield Compton's Early, Leaming and White Cap Yellow Dent were in the lead and Bailey lowest with very little difference in the other four varieties. The flint varieties, North Dakota, Longfellow, and Compton's Early were slightly in advance of any of the dents in maturity; but Golden Glow and White Cap were very little behind.

The great variation in the standing of the varieties in the different counties indicates that there is no *best* variety for general use. While, as already stated, we can draw no definite conclusions from the results of one season's work it would appear that few if any of the variaties tested are early enough for some of the counties where the experiments were conducted. We intend, therefore, in arranging for the continuation of the work this year to add to the test one or two very early sorts that have not previously been grown in Quebec, in the hope of securing something more suitable than those now in use. We expect too to extend the trials to several other countries where corn growing is or should be of particular interest, and it this way get some much needed data on the question of the suitability of the various varieties to particular districts.

James Murray,

Macdonald College

SAVING THE FERTILITY

Much Can Be Done To Preserve the Essence of Manure When Piled Outside in Winter. Top of Heap Should Slope Towards Centre to Absorb Rain. Leaching Means Enormous Loss

To farmers who are not provided with sheds for the temporary storage of manure, the following suggestions, by Mr. E. F. Eaton, of Colchester, county Minnesota, will prove interesting: "We believe that the very best way of handling farmyard manure is to draw it out and spread in the fields each day as it is made", stated Mr. Eaton, in a recent letter to The Agricultural Press. "Under our conditions, however, such a practice is impossible. As all the upland portion of our farm is very hilly, manure so applied would largely be washed away. It is therefore necessary that we keep the manure in the barnyard or in large piles in the field during the winter. We have not a manure shed and as we are very careful in piling our manure, we do not lose much fertility through having it exposed.

The method which we follow in preserving manure out of doors is as follows. A level piece of ground is selected near the barn and several loads of muck are hauled and spread on this to hold any liquid that would otherwise leach away in our light soil. Starting at one end of this piece of ground, the pile is built about four feet thick. The sides are kept as straight as possible, thus giving the rain very little chance to wash out fertility.

The top of the pile is left slightly concave to absorb the rain. The manure from the cow and horse stables is mixed and tramped down hard each day. We always take care to see that the rain water from the roofs of the barn does not flow near this pile. If it did, as is the case on some farms where the manure is merely thrown out of windows, under the eaves, much of the fertility would be lost. Where only the natural rainfall reaches the manure practically no damage is done. Of course when manure is kept out of doors in this way, it is necessary to use quite a large amount of absorbents in the stables.

Occasionally when the weather is favorable and a large amount of manure has accumulated in the yard, it is hauled out to the field where it is to be used the next spring and piled in exactly the same way. It is then handy work."

TURNIP HARVESTING

Editor, Journal of Agriculture,—

ON page 123 or your last number you say that a man can pull and top ¼ acre swedes in a day. I think we can do more than that. I cut the tops before pulling, but never timed myself. Why do you charge a boy's time plowing out roots and harrowing ?

W.T.R., Granby

Answer: While it is quite possible that a skilled worker may do more than ¼ acre a day in pulling and topping swedes by hand, there are on the other hand many men who will not accomplish that much, and we consider the above acreage a fair, conservative estimate of a day's work. The reason why a boy's time was charged on the account of plowing and harrowing is this, that unless the horses are exceptionally well trained and the man an expert plowman it is difficult for him to manipulate the plow which, with the coulter taken off, is likely to dangle a little from the knocks against the roots. When the boy is driving and keeping the horses steady the man can devote his whole attention to the plow. Again, in harrowing, the man can commence to clear the road for the waggon immediately after the boy starts harrowing, and no time will thus be lost.

P. A. BOVING

Editor, Journal of Agriculture,—

Have read your article on the Cunningham harvesting method with great interest. Do I understand that these swedes are to be fed to cattle as they appear much too large for marketing purposes? You do not speak of trimming the roots which is the longest part of the cutting operation, and without this being done the swedes would not be saleable.

J.M.G.

Answer. The method as described applies particularly to feeding roots but there is no reason why it could not be adopted in harvesting swedes for the market. Mr. Cunningham, as a matter of fact, sells quite a number of swedes for table use. After having hauled the roots he selects them and trims only those roots which are to be sold. Where a man goes in for marketing principally we would not advocate the use of the ordinary harrow for cleaning purposes, but would prefer a specially built wedge-shaped harrow with round teeth, cut from a pipe say ¾" wide and set comparatively close so as to force out the roots to the sides without bruising them.

P. A. BOVING

THE MISSISQUOI PLOWING MATCH

THE Missisquoi County Plowing Association held its thirty eighth annual event on the last Thursday in October on the farm of Mr. Albert Richard at St. Armand. This site was the same as that of many another hard fought plowing battle of previous seasons. On this occasion, though the number of the competitors was not as great as at some of the former occasions, the competition was keen and the standard of workmanship was excellent. Unfortunately the forenoon witnessed an extremely heavy rainfall, a fact which prevented may from being present to observe the important lessons being taught by the competitors. However, the afternoon cleared off beautifully and the attendance was fairly good. Mention should be made of the fact that there were a number of very good teams on the field. These good work horses shared the interest of the spectators with the good workmen throughout.

The prizes for the match were contributed by the Provincial Department of Agriculture, a number of local parties, and by some of the implement manufacturers.

The result of the competition was as follows:—

Open Class—1 D. McArthur, 2 T. G. McGovern, 3 A. E. Stewart, 4 T. E. Stanley.

Senior Class—1 James Aitken, 2 G. Walgate, 4 O. Rocheleau.

Junior Class—1 E. Williams, 2 L. E. Guthrie.

Gang Plow—1 L. P. Dandurand, 2 L. Rocheleau, 3 G. Rheaume, 4 V. G. Jenkins.

Nursery Class—1 H. W. Guthrie, 2 A. D. Rheaume.

Special Prizes:

Neatest and best outfit for plowing purposes—Open Class, D. McArthur; Senior Class, James Aitken; Junior Class, E. Williams; Gang Plow, A. Rheaume; Nursery Class, H. W. Gurthrie.

Best crown in field—1 D. McArthur, 2 T. McGovern.

Best finish in field—1 D. McArthur, 2 A. E. Stewart.

Best ins and outs—1 T. S. Stanley, 2 A. E. Stewart.

Best plow team—1 D. McArthur, 2 T. S. Stanley.

Best team—James Aitken.

The judges were:

For Plowing, Messrs W. T. Tait and T. G. Campbell.

For outfits, Messrs E. H. Hubbard and J. B. Dionne.

SEED GRAIN

EARLY attention should be given to the seed grain which is to be sown next spring. If no special fields for seed purposes were grown last summer, next season's requirements may be met by very careful recleaning of the main crop harvested last autumn. One can never afford to sow weed seeds, and one can seldom afford to sow grain more or less mixed with other types. The fanning mill should furnish plump seed free from weeds. If other grains are present, such as oats in wheat, or barley in oats, it will be necessary, and quite worth while, to hand-pick two or three bushels during the winter so as to have a field of an acre or two to furnish pure seed for the following year. Hand-picking may appear too laborious to anyone who has not tried it, but by devoting to it an hour or two at a time a great deal can be accomplished in the course of a few weeks and without undue strain on the eyes.

If there is any doubt about the vitality of the seed, it should be tested either at home (as described in "Seasonable Hints" No. 1), or a sample sent to the Dominion Seed Branch at Ottawa.

CHANGE OF SEED

The best advice in regard to change of seed is this: *change only when you are sure you are getting something superior to your old stock.* The new grain should be true to variety and free from weed seeds. A very great danger in obtaining seed from a long distance is that it may contain new and dangerous weeds.

PURCHASE OF SEED

If new seed is to be purchased, enquiries should be made early in the winter from those who have grain for sale. No large purchase of seed should be decided upon without first seeing a sample and obtaining a statement as to its germination, and as to the quantity of other grains present.

To intending purchasers of seed grain the Dominion Cerealist will be glad to furnish information as to possible sources of supply of the varieties they desire. Farmers who have seed grain for sale are requested to communicate with us.

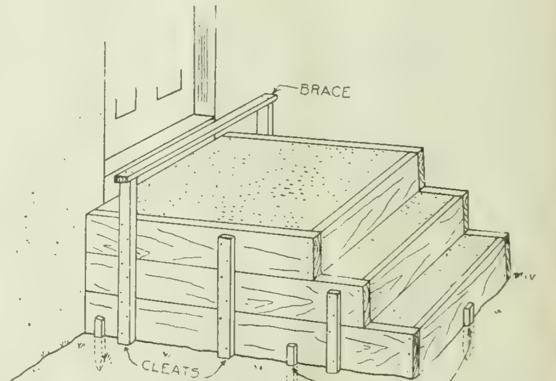
C. E. SAUNDERS,

Dominion Cerealist

SIMPLE CONCRETE STEP CONSTRUCTION

STEPS are not only subject to hard usage, but when constructed of wood with the lower part in contact with the ground and subject to alternate wetting and drying, decay is very rapid, making them unsafe and dangerous. Steps at the rear or kitchen entrance of the house encounter especially hard usage, but it is a very easy matter to have them durable and safe by constructing them of concrete. A simple method of doing this is shown in the accompanying drawing. The three forms consist merely of that number of boxes open at top and bottom and also at the end adjoining the door-sill.

A rise of 8 inches and a tread of 10 inches will be found convenient. For this reason the height of each box should be 8 inches, since every box will form a step. All of the boxes should be of the same width, but each one is 10 inches shorter than the one beneath it, thus forming the tread of the step. If the steps are few in number and not too wide, 1-inch boards will be stiff enough to hold the concrete without bulging, but if there is any doubt about this it is better to use 2-inch plank. The concrete for the steps should be mixed in the proportion of 1 bag of Portland cement to 2½ cubic feet of clean coarse sand to 4 cubic feet of crushed rock or pebbles. The earth beneath the steps should be excavated to a depth of 6 inches below the surface, the excavation being the exact size of the bottom of the steps. Make sure that the earth is level and compact at the bottom of the excavation. Place the largest box in position around the edge of the excavation, staking it in place at two or three points to prevent shifting. Level the first box very carefully by means of a carpenter's spirit level. The concrete, mixed dry, should be deposited in the box and thoroughly tamped and compacted until moisture rises to the surface. Work or spade the concrete thoroughly along the sides of the forms so as to produce a smooth surface. At the front end of the box, where the concrete becomes the tread, the surface of the concrete is carefully leveled off and smoothed with a trowel for a distance of about twelve inches from the outer edge. Immediately after this is done the second and smaller box is placed on top of the first one, being fastened thereto by a few nails through the upright cleats shown in the drawing. The nails must not be so long as to project through the forms and into the concrete. Fill the second box with concrete immediately, being careful that no dirt or other foreign matter falls or collects on the surface of the first batch of concrete, as this would prevent a good bond between the two layers. Finish this step or slab in exactly the same manner as described for the first step. The last or third step is constructed in exactly the same manner as those previously described.



Simple Farms for Constructing Concrete Steps.

The brace between the two back cleats is for the purpose of preventing the boards from spreading at the side next to the wall. The outer surface of the top step is carefully leveled off with a straightedge and finished by troweling to a smooth surface. Excessive troweling, however, must be avoided. Not more than a half hour should elapse between placing the concrete for each step so that the concrete first deposited will not harden and set up before the next form is filled. After the steps are about one week old, the forms may be removed and the steps used. After the forms are removed any roughness or irregularities may be smoothed down and the surface of the entire steps finally finished by rubbing with an old piece of emery wheel and water or carborundum and water. Where the work includes many steps, a hollow space is generally left under the main body of the steps to effect a saving in materials. Where this is done the platform and steps are reinforced with steel rods or heavy wire mesh to prevent cracking.

LIVE STOCK

THE CARE OF THE LATE WINTER OR EARLY SPRING LITTER

THE present year promises to be a profitable one for the swine raiser. The Danish exportation of bacon to Great Britain has been severely curtailed because of war conditions, and as a result the mother country is demanding a great deal of bacon from Canada; consequently prices have gone up. Naturally hogs of the bacon type are most in demand, but because of the exportation of a great deal of our bacon, the prices in the fresh pork trade on our local markets are almost certain to maintain a high level. With this prospect of high prices in view and for patriotic reasons it behoves every swine raiser and farmer to produce as much pork as possible. One way to increase production is by caring for the litters in such a way that a maximum number of thrifty pigs may be reared from each litter. The management of the late winter or early spring litter, because of severe weather conditions, calls for a considerable amount of skill and careful attention.

The care of the litter should commence with the care of the sow during pregnancy. The breeder should try to have his sow in good, vigorous, healthy condition, not too fat nor yet too thin. Provide a meal ration that is not too fattening, but which contains considerable bone and muscle forming material. A ration of equal parts of ground oats and middlings, or one of equal parts of ground corn, ground oats and middlings, might be suggested. Alfalfa is the very best roughage, but clover hay may be used when alfalfa is not available. Roots form the best source of succulent feed, sugar beets or mangels being the most palatable and beneficial. It is important that the sow be housed so that she may take considerable exercise.

About a week before farrowing time the sow should be placed in the farrowing pen. This pen should be shut off from the main part of the piggery or else be in a separate building so that it may be possible to get good ventilation, fresh air and dryness. At Macdonald College where several sows farrow during severe weather, it has been considered advisable to place a small stove in that part of the piggery devoted to farrowing pens. In addition to supplying warmth, the stove aids ventilation, and the result is fresh, dry air.

As farrowing time approaches care must be taken to avoid constipation in the sow. This condition is very serious, and results usually in the loss of most of the litter and endangers the sow's life as well. To prevent constipation give the meal as a thinner slop and keep up the supply of roots. It is advisable not to use long straw for bedding, particularly in the case of large, clumsy sows,—for the little pigs often get entangled in the long straw and are crushed. Cut straw or chaff may be used, in any case give only a moderate amount of bedding. A guard rail of some kind should be placed around the wall near where the sow makes her bed.

An attendant should be on hand at farrowing time but need not interfere unless it seems necessary. If farrowing is prolonged, or if the pigs are weak, remove them and place them in a warm place. Sometimes a pig born apparently dead may be revived by slapping smartly on the side, or by opening its mouth and blowing into it. Chilled pigs may be helped by immersing all except the head in water at a temperature of about 98°F., then rubbing dry and placing in a warm place. When farrowing is completed and the sow becomes quiet the pigs should be returned and allowed to suck. The sow's meal should be fed in the form of a very thin slop for some time after farrowing, gradually bringing it back to a thicker condition. The feeding of roughage and roots should be continued. There is no need of being in a hurry to start feeding the sow after farrowing, but it is advisable to have available some water to which a little meal has been added.

Occasionally an unthrifty pig will be noticed in the litter. Examination of the mouth will sometimes show black teeth. The points of these should be snipped off with a pair of small pliers. In the case of a small litter on a large, fat, heavy milking sow, thumps are liable to occur in the litter. The symptoms are a great accumulation of fat at first and later a sort of palpitation, the pig panting like a horse with heaves. The disease may be prevented by cutting down the sow's ration so that her milk will not be so abundant nor so rich, and by making the little pig take exercise. Another disease that may occur is scours. A tablespoonful of sulphate of iron in the sow's feed from time to time will help to prevent scours. In severe cases one to two teaspoonfuls of castor oil may be given to each pig affected.

When the litter has reached the age of about three weeks it is time to commence to teach the pigs to eat. Arrange a small enclosure with a partition of slats so arranged that the young pigs can get through while the sow cannot. Place a low trough in this enclosure. Start the pigs on skim milk.

If skimmilk is scarce, oatmeal siftings may be used as a supplement. A little care is necessary in starting the pigs on oatmeal siftings, but once started they do exceptionally well on it. With a good supply of skimmilk, shorts or middlings may be added, gradually increasing the meal as the pigs grow older. Too much emphasis cannot be laid on the importance of having skimmilk for young pigs. It is extremely valuable in this period of the pig's life, and it is hard to successfully substitute as a feed for growing pigs.

The castration of all male animals not intended for breeding purposes should be performed when the pigs are from four to five weeks old. Weaning may be done when the pigs are from six to eight weeks of age depending upon the condition of the sow and upon how well the litter is coming on. If the sow is in good condition the pigs may be left on until they are about eight weeks old. If the sow is getting rather low in condition it is usually advisable to wean the pigs a little sooner. It is a good practice to gradually wean them off, keeping the sow away for a few hours the first day, gradually increasing this period for a few days. If the little pigs have learned how to eat there will be no difficulty in weaning and the pigs will not be hindered in their development.

A. E. MACLAURIN

ASSISTANCE RENDERED BY THE DOMINION DEPARTMENT OF AGRICULTURE TO ASSOCIATIONS IN THE PURCHASE OF HORSES, CATTLE, SHEEP OR SWINE FOR BREEDING PURPOSES

OWING to the heavy drain upon the live stock of the various warring countries of Europe, they have been forced to go abroad for supplies. The longer the war lasts the greater will be this demand. Moreover, when peace is restored, these countries will require large numbers of the various classes of animals to replenish their studs, herds and flocks. It should be borne in mind, however, that the buyers who come to this country after the war will require better animals than have been bought during war time, as they will be used largely for breeding purpose.

With this end in view, the best of the females and particularly the young stock should be kept

The home of Mr. and Mrs. P. B. Buckland of Ways Mills, Stanstead Co.

for breeding purposes. Breeders should not fail to raise all the live stock possible at this time, in order that the country may be able to supply a large number of the animals that are certain to be needed by the warring countries. At present, however, there is an unequal distribution of live stock in the country. In certain sections there is a heavy surplus, with a corresponding scarcity in other parts. During the past year hundreds of young cattle from our Prairie Provinces have gone to the United States as stockers and feeders. These should have been kept at home, particularly the females. Sections of the West are reported as being in need of good draft horses, particularly draft mares; while, in sections of Ontario, there is an over supply of this particular class.

In order to remedy these conditions, the Minister of Agriculture, through the Live Stock Branch, has decided to grant liberal aid to breeders who wish to secure good breeding stock. The conditions under which aid will be given are as follows:

In the event of a number of farmers in any district of Canada wishing to co-operate for the purchase of breeding stock in carload lots from some distant section of the country, the Department will pay the travelling expenses of their duly appointed representative during the time required to effect the purchase and transport the shipment to its destination.

Should it be desired, the Live Stock Commissioner will nominate a suitable person who will be directed to accompany this representative and assist him as far as possible in buying and shipping the animals.

Persons wishing to take advantage of this offer should make full arrangements with the Live Stock Commissioner as to place and time of purchase before sending out their representative.

SOME FLOCKS, HERDS AND FARMS OF THE BEDFORD DISTRICT

VIII. The Pinehurst Jersey Stock Farm

PINEHURST Jersey Stock Farm, Cowansville, Quebec, is well known in live stock circles as the home of the Jersey herd of Charles Ruiter and Sons. This farm is situated about one mile south of Cowansville and comprises 150 acres of land, of which about 70 acres is cultivated on a four year rotation.

The herd consists of about 45 head of which 20 to 25 are milking cows. The herd bull is the two-year-old Canadian Fairy Boy, which has won first place at Sherbrooke as calf and as yearling, and has headed the first prize Junior herd at the same fair. Canadian Fairy Boy is a grandson of C. I. Hudson's $8,500 bull, Raleigh's Fairy Boy.

The Messrs. Ruiter ship cream to Montreal and their Jersey cream naturally is always in demand. The skim milk is used partly in the feeding of the calves, partly for the pigs of which the farm has a herd of about 20 Tamworths. The Messrs. Ruiter are firm believers in the testing of cows. They weigh the milk of each cow in their herd regularly and make milk fat determinations monthly. They are members of the Cowansville Cow Testing Association.

Head of the Pinehurst Jersey Herd.—Chas. Ruiter & Sons, Cowansville.

In the herd are two-year old heifers that made over 400 lbs. of butter with first calf and two three-years-olds, one making over 500 lbs. of butter and the other over 600 lbs.

Messrs. Ruiter have made a success of alfalfa growing. They had last year six acres of this crop, which in the middle of August had yielded two crops of about 3½ tons per acre and had a third crop nearly ready for cutting. That they are also thorough believers in corn as a feeding stuff is shown by the fact that they have two silos—each 14 x 20 feet.

In addition to their cattle and swine they keep a flock of pure bred fowls of the silver-laced Wyandotte breed, about one hundred birds in all.

The firm comprises the father, Mr. Chas. Ruiter, who has been breeding Jerseys for over twenty years, and the two sons, Andrew and Percy. Mr. Ruiter's original herd were unregistered Jerseys but in the last eight years the herd has been gradually transformed into a stock of registered animals. Pure bred sires have been carefully selected with a view to developing a cow of definite type, a straight-backed, large-barrelled, stylish animal, weighing about 900 lbs. and producing at least 400 lbs. of butter from a well-shaped udder with good teats.

IX—A Successful Hay and Grain Farm

PIKE River Parish, lying to the north of Missisquoi Bay, contains some of the most fertile farms of the flats of Missisquoi County. In this parish we visited the farm of a strong believer in good seed. Mr. Louis Rocheleau, Stanbridge, P. Q., has been for many years a prominent member of the Canadian Seed Growers' Association. On his 200 acre farm he has about 70 acres in hay and 50 in grain. Corn and roots occupy the remainder of the land under cultivation. Mr. Rocheleau's barley and Banner oats, grown from registered seed, were beautiful and bountiful crops. There was also a field of Dodd oats which was even and strong. The hay crop, which he was harvesting at the time, would have made many poorer farmers and many good farmers of poorer farms envious. Mr. Rocheleau makes a good income from the sale of his registered seed. He has a small herd of grade Holstein and Ayrshire cattle, a few Yorkshire pigs and geese, turkey and fowl. His farm is exceptionally well equipped with machinery. Mr. Rocheleau's farm is the site of one of the demonstrations in root seed production conducted by the Cereal Department of Macdonald College.

J. F. S.

FALL TRADE IN HOGS

By R. N. Watt, Manager—The Wm. Davies Co. Limited, Montreal, P. Q.

NOW that we have come to the end of another year it should be helpful to look back and see what lessons can be learned from the past year's experience. Unfortunately in reviewing the market for hogs in the Province of Quebec we can only refer to about the last four months in the year, as our farmers have not yet realized the advantage of having two litters of hogs per year. We believe, however, that the Fall trade in many places in hogs has registered a new situation, in that many farmers who have always slaughtered their own hogs and sold them "dressed" have sold them "alive". The general price on dressed hogs through the fall months has ranged from 9½ c to 12 c. During the first week of October the general price was 12 c, but towards the latter end and the first week in November the prices dropped to 9½ c to 10 c. Most farmers expect a drop in the months of November and December as it is at this time that hogs generally come on the market more plentifully, and as in previous years there was not this year the demand to take care of the supply of dressed pork. This year, however, the Minister of Agriculture, the Hon. Mr. Caron, got in touch with the large packers in Montreal and discovered that they were willing to pay a price for live hogs in the country, which would be equivalent to 11½ c dressed, and that they were prepared to take any quantity which offered providing the quality was right. The Minister induced the packers to send representatives to all parts of the Province and to endeavour to establish a connection in each parish to buy live hogs. The packers were only too willing indeed to do this, as they have long hoped that the farmers in Quebec would realize the great advantage of raising hogs to supply their requirements without having to go to the Western Provinces. They therefore immediately despatched men to all parts of the Province, and at the same time interviewed the local shippers who come to Montreal, with a view of buying live hogs. They found that owing to the interest which has been created with the farmer by the Department of Agriculture during the last two or three years, the breed of hogs was good, and that although the majority of the hogs are not finished as well as they require, many were, and the result was that they purchased at many points in the Province, cars of live hogs. In this connection I would like to point out that it is absolutely necessary for a packer who sells his bacon for export to kill his hogs in his own plant. There are two reasons for this. First, export pork must be slaughtered under Government inspection; second, close control of temperature is necessary to produce bacon of the best quality.

I am sure that many farmers who read this article will have heard for the first time last fall that there was a market for live hogs in Montreal. The result of the packers' efforts to buy hogs in the province is very plainly seen to-day. As I intimated earlier, the price on dressed hogs had fallen to 9½ c to 10 c. Inside of a month, the price of dressed hogs has risen to 11½ c to 12 c per pound. There can only be one cause for this, as farmers well know that in the month of November and December a rise in the price of dressed pork is very unusual; therefore, the only cause can be the competition established by the packer. The farmer can reasonably ask, "Why has not the packer competed for the hogs before"? The answer is simple. Until this year very few farmers have grown hogs suitable for the packer who caters to export trade. The packer can only handle good quality hogs and unless the farmer realizes this he will not receive the benefit of competition from the packer. I am glad to see that many farmers indeed have availed themselves of the education which the Department of Agriculture and the Agricultural Colleges are only too willing to give, and are now growing hogs which are admirably suited to make bacon for export trade. All these farmers need is to grow more, and to have them for sale all the year round.

I am quite willing to acknowledge that I personally was very much surprised at the good report which my men were able to bring me of the quality of the hogs in many Districts in Quebec. The Eastern Townships counties such as Brome, Shefford, etc., also the Districts of Chateauguay, Beauharnois, and Huntingdon, have for many years grown hogs suitable for packing purposes. We have seen many hogs from the counties of Drummond, Nicolet, Arthabaska, Megantic, Beauce, and all the counties along the South Shore of the St. Lawrence, and in every instance we have found the quality of the hogs good. This is also true with counties on the North Shore of the St. Lawrence, with the exception of Joliette, Berthier, and

Maskinonge. These three latter counties need very much improvement. We have also had reports from the Lake St. John District and the hogs there are good. We have also seen hogs in Wright, and Labelle, and these are good. In fact, with the exception of the three Counties mentioned above, the farmers are breeding along correct lines, and a great majority of their stock is suitable for a packer's purpose. There are of course some farmers who are yet clinging to the old style of Canadian Razor Back Hog, but our reports tell us that these are becoming more and more scarce, and if the farmer continues to improve he will find a ready market for all the Hogs which he can grow.

I would like to mention the question which all farmers will have to decide; that is, whether they will elect to sell their hogs dressed or alive. As packers we only buy live hogs, but I do not wish to quarrel with the market for dressed hogs. I would urge, however, upon every farmer the importance of taking absolute figures to show the difference between the returns he obtains when he sells his hogs alive and when he sells his hogs dressed. When he sells his hogs alive he is able to feed them in the morning before he takes them to the scale. Most farmers who kill their hogs themselves starve them 24 hours before killing, and sometimes in taking their tests they weigh them just before killing and use this figure as their test weight. This, however, is not fair. They should weigh them an hour or two after feeding, as it would be this weight for which they would obtain payment if they sold them alive. This point is well worth considering as it would often mean 10%. Every farmer should satisfy himself on this point as there is no question that it will be one which will come before him many times during the next few years.

I would also like to say a word about summer breeding, a system in which the farmer breeds his sows in July and August, and has hogs for sale in the spring months. Many farmers in Quebec have only bred their sows once a year. As far as I can learn there have been two reasons for this. First, as the farmer slaughtered his hogs at home he could not take care of the dressed pork during the warm weather. So far as this is concerned if the farmer markets his hogs alive he has opportunity to sell every week in the year. A packing house requires hogs all the time to keep its business going. The other point which has been mentioned is that the farmer does not figure that he receives an extra return for the additional cost in feeding hogs during the winter. In this connection I would like to point out that figures over a number of years show that hogs are worth from 1 c to 1½ c per pound more in May and June than they are in October and November. Hogs marketed in the spring months are available for bacon for summer trade. The rule of the English market is that it is higher in the summer time than it is in the winter months. A farmer, therefore, who breeds his sows to have hogs available for sale in the spring, can depend on receiving a higher return for his spring than for his fall hogs.

I am sure that there is a great future indeed for the hog industry in the Province of Quebec. The tests which have been taken show that they can be raised at a profit and there is aready market for all hogs which can be raised.

Every farmer if he has not already done so in this province, should breed an extra two or three sows so that he will have more hogs available for sale next winter.

The market at present is practically unlimited, and instead of the packers of Montreal having to buy 70% to 90% of their killings in Ontario, Manitoba, Saskatchewan, and Alberta, they should be able to buy them in Quebec. Packers in Montreal send thousands of dollars annually out of the Province of Quebec to purchase live hogs, which should remain at home and go into the pockets of Quebec farmers.

THE CHAMPION DAIRY COWS OF CANADA

THE following are the highest records made up to the present by cows of the various breeds and ages in the Canadian Record of Performance.

AYRSHIRE

Class	Name	Lbs. milk,	Lbs. fat.
Mature.	"Milkmaid 7th", 28769	16,696	729
4 year old.	"Daisy of Ferndale", 26735	15,534	590
3 year old.	"Springhill White Beauty", 28757	12,522	539
2 year old.	"Briery 2nd of Springbank", 32137	14,131	520
	FRENCH CANADIAN		
Mature.	"Filie", 2130	10,767	453
4 year old.	"La Belle", 869	7,196	357
3 year old.	"Empire", 2395	7,992	338
2 year old.	"De Clairvaux 3eme", 1650.	6,649	329
	GUERNSEY		
Mature.	"Gipsy of Willow", 392	10,249	507
4 year old.	"Gipsy of Willow", 392	11,445	520
3 year old.	"Beauty's Belle", 393	8,540	466
2 year old.	"Dairymaid of Hillside", 125.	9,352	464
	"Beauty of Willow 2nd", 655.	9,380	486
	HOLSTEIN-FRIESIAN		
Mature.	"May Echo", 3372	23,707	833
	"Lillie DeKol Lucknow", 10484	22,189	841
	"Daisy Pauline Pietertje", 7142	23,807	830
4 year old.	"Fremona 2nd", 10526	20215	649
3 year old.	"Baroness Madoline", 16299.	20,710	770
2 year old.	"Jenny Bonerges Ormsby", 8216.	16,847	666
	" Lady Pietertje Canary's Jewel", 17314	17,562	664
	" Duchess Wayne Calamity 2nd", 15514	16,714	677
	"Lilith Pauline Calamity Jane 3rd", 23946	19,554	660
	JERSEY		
Mature.	"Sunbeam of Edgeley", 629	18,744	926
4 year old.	"Primrose of Edgeley", 932.	11,246	561
	"Buff's Lassie", 1373	10,797	573
3 year old.	"Nellie of Draffan", 2447	8,982	604
	"Princess Flo of Edgeley", 1603,	10,838	598
	" Springbank Butter Girl", 4045	12,544	608
2 year old.	"Lady Edith", 2439	11,094	563
	SHORTHORN		
Mature.	"Dairymaid", 86086	13,535	540
4 year old.	"Clara", 93899	5,794	201
3 year old.	"Nina of Northlynd", 97555.	8,037	369
2 year old.	"Lady McDonal 3rd", 101013	7,049	281

Note:—In comparing the above records with those made in the United States, readers should bear in mind that the Canadian Record of Performance requires that the cows should drop a calf within fifteen months after the beginning of the test. When most of these records were made there was the further provision, now abolished, that she must have dropped a calf within the fifteen months previous to the beginning of the test.

FEEDING HOGS FOR MARKET*

Prof. Geo. E. Day, O.A.C., Guelph, Ont.

*Synopsis of an address at the Guelph Winter Fair, December, 1915

I QUESTION if it ever pays to keep hogs on a maintenance ration and then finish for market by heavy feeding in the last few weeks. My conclusion is based on the fact that young animals will make cheaper gains than older ones and it pays to hustle them right from the start. In experiments that we have conducted the following results have been obtained:

Weight.	Meal per 100 lbs. gain
54 to 82	310
82 to 115	375
115 to 148	438
148 to 170	455

These figures show the more economical returns from feeding the younger animals. In another experiment at Guelph we had pigs, fed on meal and water alone, make 100 lbs. of gain on 280 lbs. of meal. It just happened that these were particularly good pigs, but the result goes to disprove the common claim that pigs cannot be fed at a profit without skim milk, but a good substitute for it may be found in some of the best brands of tankage. And I would emphasize the fact that tankage is a food, not a tonic.

Pasturing Market Hogs

I would always supplement the best pasture with grain feeding and I do not believe in letting pigs have too much range when they are intended for market. They can be put on pasture at 100 lbs. weight. Red clover is one of the best pasture grasses for pigs. Alfalfa is better for the pigs than the pigs are for the alfalfa. Here is a pasturing plan that we find good.

Divide the hog pasture into two equal plots. Plow one-half in the spring and sow to grain seeded down with clover. Cut the grain early for hay or green feed and in a short time there will be good pasture available for the pigs. This same field will afford spring pasture for the pigs until the grain has been cut off the second plot, seeded the second spring. Or, again, clover hay may be gotten off by the end of June, and by the end of July the aftermath will afford good pasture for spring litters. Rape is not as good a pasture for hogs as is clover. On pasture we would feed three-quarters of the full meal ration.

WHAT IS BACON ?

BACON is mild cured and mild smoked pork from pigs of moderate size. In the old world the name is used for the meat from several parts of the pig, but in America it is mostly used for the bellies (breakfast bacon) and the backs (Windsor bacon), while all the other kinds of cured and smoked pork prepared like bacon are given special names, for example hams, picnics, rolls, etc. This difference depends on how the pigs are cut up and prepared for market. In the English market a large amount of bacon is sold in whole sides to the retailers (Wiltshire cut), and only a small portion is sold as hams, backs, bellies and shoulders; the sides are not cut up until after smoking. In America the sides are cut up before the curing, when the bacon is not for export.

It is, however, a mistake to believe that all mild cured and mild smoked pork can be called bacon. It is only bacon when given a special cure and fermentation, without which it would not have the proper flavour.

An even temperature of 38 to 42°F. should be maintained in the curing room, and if it is desired to prepare bacon throughout the year the curing rooms will have to be cooled in the summer and heated in the winter. There are various methods of curing, such as dry-curing, tank-curing, and auto-curing, tank curing being the method more generally used. The largest pieces of pork have to be injected with pickle before being put into cure, the injecting pickle consisting of pure water and salt as strong as possible (100 degrees), mixed with nitrate of potash to 108 to 116 degrees, according to circumstances. Nitrate of soda should never be used as it gives the lean meat an ugly gray colour. Most of our nitrate of potash comes from hostile countries,—Austria and Germany, and owing to the war prices have risen considerably.

Dry-curing takes about one week, tank-curing from 3½ to 5 days, and auto-curing only a few hours. In all cases the bacon is given an after-curing and also drainage from 4 to 5 days, and during this drainage fermentation will take place. Under the injecting process care should also be taken of fermentation, for the injection pickle is frequently mixed with a little old pickle containing too many bacteria, which would give the lean meat a dark mahogany colour when cut up and kept a short time in the fresh air.

(Professor), A. HANSON

VETERINARY QUESTIONS

Editor, Journal of Agriculture,—

GARGET

WE have a very heavy milking cow that has had several attacks of garget. The udder was very much swollen and is now taking considerable time to return to normal condition. What would you recommend as a treatment, also what to do to prevent its recurrence?

E.A.S., Brome County

The treatment will vary with the type and stage of the disease. If the case is seen when the first symptoms develop every effort should be made to cut short the course of the disease. Copious drinks of warm water, application of heat in some form to the udder and friction to the extremities with a drench of a pint of alcoholic liquor or two tablespoonfuls or ground ginger may serve to offset the attack. If the case is further developed and the inflammation more intense, rub the udder well with camphorated oil and milk four to six times a day, including a treatment after each milking. The milking must be done with great gentleness, squeezing the teat rather than pulling or stripping. It is also of great benefit to give some form of brisk purgative to remove the waste products from the body, for example epsom salts, 1 to 2 lbs. and one tablespoonful of ginger given in half gallon of warm water as a drench. If the pain in udder is great or inflammation continues, good results can be attained by persistent fomentation of the affected part with hot water.

A handy and effective manner of applying hot water is as follows: — Place a large-mouthed bucket, filled with hot water, under the udder. With an attendant on either side of the animal use a heavy blanket passed under the animal, lower it in the hot water till thoroughly soaked, then press it close to the inflamed parts. Repeat this when the blanket has cooled. The water in pail must be kept hot. After using hot water the udder should be thoroughly dried and rubbed with soap. The principal cause of the disease is poor management. The animals may be left standing in a draft, or they may not be milked at the proper time. The sudden and extreme change of temperature, and chiefly the forcing of a milking animal beyond her capacity with rich albuminous foods like cotton seed meal, peas, etc.

To feed the animals to their capacity without overdoing it should be the ambition of every herdsman and farmer, but to do this he must constantly be on his guard to detect any symptom that may manifest itself. He should study and note the various capacities of the different individual animals, and feed and care for them accordingly, for in the period of full milk the organ is so susceptible that any serious disturbance of the general health is liable to fall upon the udder.

MOON-BLINDNESS IN A HORSE

Editor, Journal of Agriculture,—

I have a gelding six years of age that has had two attacks of moon-blindness. What is the cause of this trouble and what would you recommend to prevent its recurrence ?

R.S.P., Argenteuil Co.

Moon-blindness, more properly called *periodic ophthalmia*, is peculiar to horses and is an inflammatory infection of the interior of the eye. It shows a strong tendency to recur again and again till after the fifth or more attack when it terminates in permanent blindness from cataract. The attacks may follow each other at intervals of a month, more or less, but show no relation to any particular phase of the moon, as the name moon-blindness would lead one to think. The attacks are rather determined by the general health, weather, food, etc. There is no doubt that some specific germ is responsible for periodic opthalmia, but it has not yet been discovered.

The disease is more prevalent in damp clay or marshy localities and the rank feed from such places has a strong tendency to produce the disease. The great majority of victims are from two to six years of age. Heredity is also accepted as a most potent factor, and breeders and horsemen everywhere should refuse to breed from either horse or mare that has ever suffered from this disease.

Treatment generally is not very satisfactory, but a purgative of aloes, followed by saltpetre and cold applications to the eye, has some beneficial effect. Change of locality and feed may prevent any further attack. The animals should be kept in a cool well-ventilated stable as this has a tendency to build up the general health and ward off disease. The prevention of this disease is the great object to be attained, and for this we require the most careful breeding, feeding and housing. Animals should be kept away from low lands; improvement of the land by cultivation and drainage should, however, be the final aim.

UNTHRIFTY MARE

Editor, Journal of Agriculture,—

I have a mare in foal that for some time has been losing flesh. Her hair is rough and unthrifty, and she does not show any return for the feed she has been getting. Her manure is often thin and contains a number of small white worms. Would these worms be the cause of her condition, and what would you recommend as a treatment for them ?

A. W., Chateauguay Co.

As your mare is carrying a foal it would not be advisable to give her a drastic purgative, but strict attention should be paid to her feed and general care. She should have well-cured mixed hay and grain, with a bran mash once a week to which has been added one tablespoonful of saltpetre. For exercise give light regular work, and if that is impossible she should be turned loose in a paddock.

The teeth may have some bearing on her unthrifty condition, and I would recommend having them examined by a veterinarian, for a mare with sharp points on her teeth is liable to swallow her food without sufficient mastication and set up digestive disturbances.

The small white worms, presumably the common pin worms, unless in very large numbers, would hardly cause the condition present. In the event of her continuing to pass them a drench of one pint raw linseed oil to which has been added four tablespoonfuls of spirits of turpentine will be found beneficial.

Be careful in drenching any animal. Do not hold the tongue nor raise the head above the line of throat, as there is danger of pouring the fluid into the lungs or of causing choking.

N. E. McEWEN, V.S.

Macdonald College

THE DAIRY

PASTEURISED MILK

MOST of our readers are well acquainted with pasteurised milk. The term stands for milk of a special quality and very few have given much thought to what the meaning of the word *pasteurisation* is. Recently a lawsuit in the province has brought the question more than ever before the public eye. Pasteurised milk was sold containing nearly a million organisms per half teaspoonful (cubic centimetre) and the officials concerned called this milk unwholesome. In a few lines we will endeavour to explain the real meaning of the term *pasteurization* and the qualities our readers can demand from pasteurized milk.

Pasteurization of milk means that the milk is treated according to the method of Pasteur, the renowned French scientist, whom we might call the father of bacteriology. He found that milk soured by the action of the lactic acid bacteria, harmless organisms in themselves. By heating the milk for a short time to 154°F. these bacteria were destroyed and still the milk possessed all its original qualities, and did not show the least "cooked" taste. Later on the useful result of this slight heating was found to be much more extensive, for not only did pasteurisation kill all acid bacteria but also all bacteria of the communicable diseases, typhoid, scarlet fever, diphtheria, etc. From this time the word pasteurized milk stood for milk that had been heated to such a temperature that the original qualities of the milk and its nutritive value were unimpaired, no "cooked" taste was noticeable, and still all lactic bacteria and disease bacteria, or in one word all active living bacteria, were destroyed. However, in addition to the active living bacteria some kinds produce also an endurance form, a rest stage, in which the organism conceals itself inside a hard outer layer and seems to be lifeless. These resistant forms, called spores, will germinate into active living bacteria under favourable conditions. Therefore when we subject milk to pasteurization these spores will escape destruction, and when counting the bacteria present after pasteurisation we shall encounter only the number of spores originally present in the milk.

How many spores may we except to find in milk duly pasteurized? This depends largely on the age of the milk and the total number of bacteria present. For example, in fresh milk with about 20,000 bacteria per cubic centimetre we may find as many as 2,000 spores. Older milk of good quality containing up to 500,000 bacteria will show about 5000 spores or 1% of the total number of bacteria present.

Investigations have shown that the milk entering Montreal seldom contains as many as 500,000 bacteria, so that pasteurized milk newly treated should show at the most 10,000 bacteria per cubic centimetre. Milk should be kept at a low temperature and the bacteria grow very slowly, so that under normal conditions the number found in pasteurised milk delivered to the customers will be about 25,000 per cc. The large cities which have bylaws regarding pasteurized milk consider these figures a fair average, and give the dealers a little more latitude. Boston allows 50,000 bacteria per c.c. in pasteurized milk; Paris (France) 30,000; Rotterdam (Hollond) 10,000; London (England) 50,000. In all these cities mentioned, every one of which is considerably larger than any Canadian city, milk of nearly a million bacteria per c.c. could not be sold as pasteurized milk, the Pasteur treatment being a protection against such bacterial numbers. We are therefore of opinion that any person who buys milk which is labelled *Pasteurized* has the right to expect milk of a very low bacterial content and which shows all the qualities of fresh milk in spite of being heated. It is the duty of the different city and town councils to pass and enforce such bylaws that dealers deliver pasteurized milk when they advertise the same.

J. VANDERLECK

MILK

The Problem and its Solution

IN the November issue of the Journal an attempt was made to state the position in which the producer, the distributor and the consumer of milk are at the present time placed. It was stated that this position constitutes the problem in the consideration of which all those concerned with milk are involved. It remains to be said that not only are those concerned with milk involved in the consideration of the problem, but that these same are equally involved in their obligation to seek, bring about and perfect a solution.

Hygienists, chemists, bacteriologists and public spirited laymen have for years been making the question of quality of milk a subject of the closest study. For a long time the chemical constitution of milk, the percentage of butter fat particularly, received, and rightly so, much attention. Adulteration of milk by the addition of extraneous water or by the abstraction of cream has been reduced to a minimum. The researches and analyses of the chemist have made this improvement possible. Based on these, the instituting of laws and regulations and the enforcement of such by local authorities, by city councils, and by provincial and dominion departments have ensured the maintenance of this improvement. Thus today as far as the chemical constituency of milk is concerned, the public is comparatively well safeguarded. When municipal control is exercised at all the purchaser of milk can feel that chemically it is of the nature and substance demanded.

It is, however, the biological constitution of milk which at the present time is a matter of the gravest concern. It is the fact that not only does milk contain bacteria, microscopic forms of plant life, but that the milk itself provides a perfect medium for the growth and multiplication of these organisms which present such difficulties in the direction of an easy solution of the whole problem of milk production and supply. During the last twenty-five years a stupendous amount of work has been done by bacteriologists on the bacterial content of milk. Publications and text books have followed each other in rapid succession; and the certainty that health and cleanliness mean freedom from bacteria, while disease and dirt mean the presence of bacteria has been proclaimed from the scientific housetops of every progressive country in the world. That bacteria cannot be seen by the naked eye complicates the matter, for like the biblical tree, it is by their fruits alone that the layman can be led to appreciate their significance. The organic cause of bacterial troubles requires the eye of a microscope to be seen at all. The effect of this cause may be so plain that he who runs may read. While the bacteriological aspect of the milk problem is that which in its entirety is the most difficult of solution, it is yet true though apparently paradoxical that with concerted action of producer, distributor, consumer, bacteriologist and health official, supplemented by government initiative, the same aspect can become capable of successful solution.

It is established beyond dispute that provided the farmer feeds his dairy cows rationally, provides them with rations intelligently balanced as regards the proportional amounts of the various food units necessary to ensure the maximum constitutional stamina of the animal, and at the same time provides for the production of as much milk as the cow by nature is capable of secreting the quality of the milk with respect to the butterfat content is not appreciably affected by excess of feeding with highly concentrated foodstuffs. In other words, if the cows are reasonably fed the quality of the milk, speaking chemically, is outside the control of the farmer. An excess of say brewers' grains will stimulate the production of milk beyond the normal capacity of the cow at the expense of the butterfat percentage; but it is conceded that provided a rational system of feeding is followed, the above contention is correct. On the other hand while the bacterial content of the milk is a question of such moment, and is an aspect so difficult of solution, it is nevertheless true that the bacterial quality of the milk is almost entirely under control. If this be true why is it then that we are still under the same necessity which prevailed 25 years ago for careful investigation on the part of the scientist, and continual agitation on the part of the hygienist? Largely the reason for this must be attributed to the fact that each respective part of the community cycle concerned with the provision of milk for consumption has not been, and still is not sufficiently cognisant of the necessity for concerted action.

To say that the bacterial content of milk is possible of control is far from saying that such control is easy, for it is not. To say that the farmer alone can exercise complete control over the bacterial content of this milk is untrue; to say that of the distributor is equally false; to say that of the consumer is just as far removed from the truth. The obligation and responsibility for bacterial control lie at the door of each of the three. If these, the farmer or producer, the distributor, and the consumer determine upon and act in accordance with concerted action, the successful control of the bacterial content of milk becomes in a lesser degree a theoretical possibility, and approaches nearer to the realm of practical accomplishment. How this is to be done is a question for a later issue.

WILFRID SADLER,

Bacteriology Department,
Macdonald College

THE MILK HOUSE

FOR the proper handling of milk there is no way that will meet the necessities of the case so well as the milk house. It will pay any dairyman to build one, and to build it with enough of enterprise mixed with the concrete to make the place completely convenient and above all, clean and sanitary. To do this requires a little bit of brains and study as well as enterprise.

It may be built right up close to the stable. That makes a very handy and convenient place, especially in the winter time. But if it is built there, it must not be forgotten that dust and dirt are hard to keep out, and full preparation must be made to solve this problem.

No better plan for this can be offered than to have at least a good wide passage way, six or eight feet long, between the milk house itself and the stable. This should be used as a room, where clothes may be changed before going from the stable to the milk house proper. Heavy boots and overalls, jackets, etc., may be left there, as well as used and dirty pails from the stable. There should be a place for washing hands, pails, etc., there, and the engine or boiler, if one is installed may be placed there, while the cream separator and the churn may be in the milk room.

Floors and walls should be concrete. There should be a ventilator in the otherwise dust-proof roof, but its openings should be covered with cheese cloth. Two good windows and a tight-fitting door are important matters. Along one side there should be a large box of concrete made to hold cans of milk and cream, while below one of the windows should be a good smooth well-made table of basswood. Under it can be placed a big drawer or box, in which the scales, the milk tester, and other delicate utensils will always be preserved from injury, and kept in good condition.

A milk house may be built at some distance from the stable where the atmosphere will be free of dust. In this case it will be found to be a great convenience if a track is built to carry a truck for the purpose of conveying milk cans from the stable. Frame-built milk houses are very satisfactory, especially if lathed with metal laths inside, and plastered with concrete plaster. If the milk house is a short distance from the stable, then it is a convenient plan to have the building large enough so that one end may be utilized as an ice house. In this ice may be stored and will be easily and conveniently accessible.

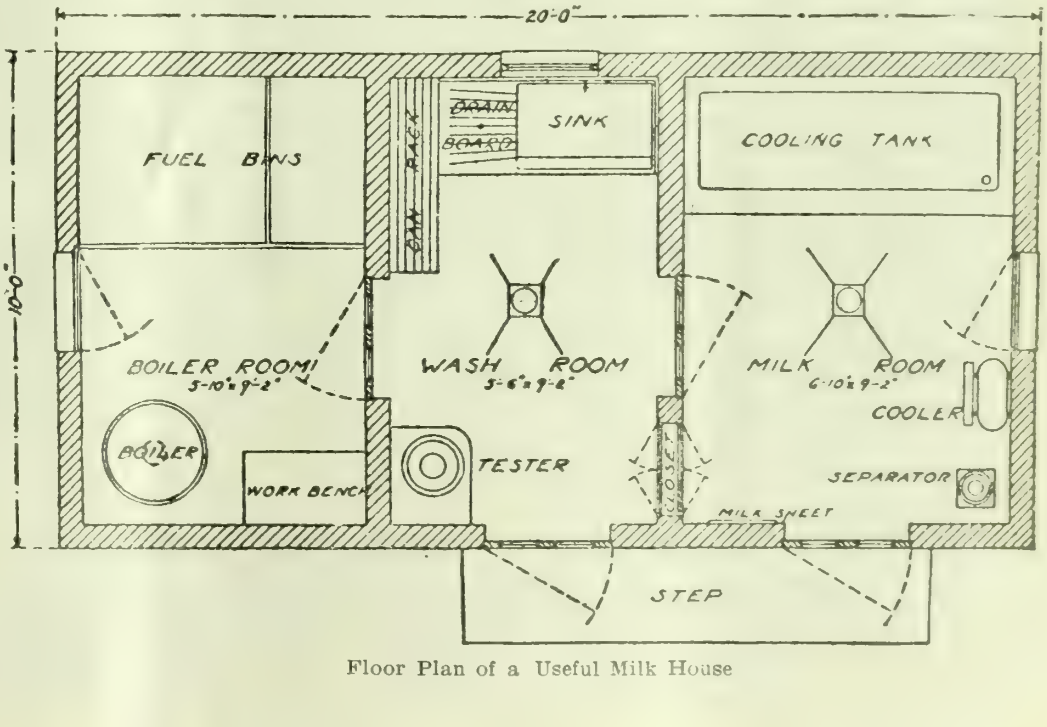
Hot water is a necessity in the milk house, and there should be some facilities for providing it. A small stove and a water boiler is the simplest plan. The more elaborate one is to install a small boiler with a furnace beneath it, and this may be a part of the boiler itself, or may be built beneath it, using fire brick. It is handier and more efficient but it costs more, and is a matter to be decided upon accordingly.—*Canadian Countryman.*

NEW POSSIBILITIES IN DAIRYING

I. Recent Changes in Canadian Dairy Conditions

An address given at the Eastern Ontario Dairymen's Convention, Renfrew, Jan. 5th, 1916

ABOUT twelve months ago I was asked to prepare a paper for the Journal of the British Dairy Farmers' Association on "Dairying in Canada." Thanks to the courtesy of Mr. Ruddick, and thanks to the addresses and papers of the



Floor Plan of a Useful Milk House

first Commissioner for Dairying, Dr. Robertson, I was provided with a fund of literature which, with my own local knowledge, I endeavoured to interpret in such a way as would convey something of value to the reader in the Old Country. I found that from this Dominion the exports of cheese have declined, in round numbers, from 196,000,000 lbs. in 1901 to 155,000,00 lbs. in 1913, a decrease of 21%; and that the exports of butter during the same period have fallen from 16,000,000 lbs. to 823,000 lbs. per annum, a decrease of 95%. Coincident with this, the total production of milk was 6,900,000,000 lbs. in 1901 while in 1911 the annual production had reached a total of 9,900,000,000 lbs, an increase of 50%. During the decade 1901 to 1911 the total population of Canada has increased from 5,350,000 to 7,200,000; the urban population from 2,000,000 to 3,300,000, an increase of 62%, while that of the rural population has been from 3,260,000 to 3,900,000 or 20%. *In brief, the position is this—within approximately the same period, the exports of cheese and butter have enormously declined, the production of milk has decidedly increased; and while the total population has increased, the urban has grown at a much greater rate than has the rural.* Being interpreted, this means an increasing home consumption of butter, cheese and milk, with a body of consumers increasing out of all proportion to the body of producers. This is a very pressing problem in economics; but in general these conditions are such as to stimulate, as they most certainly necessitate, greater exertions on the part of all those concerned in the production of dairy products, not only as to the quantity of such products but also as to the quality and the variety, and as to the efficiency with which the greatest economic advantage is taken of every succeeding national phase. I am convinced that *the present is a period of metamorphosis and, adapting a recent observation of Mr. Ruddick, one in which the changing economic conditions make it impossible to use statistics of exports to judge of the progress or decline in the dairying industry.* The rapid development of a home consumption requires the putting into practice of the greatest initiative on the part of producers. Just so long as the export trade was such as to ensure success to the Canadian dairymen, there did not appear to be any paramount necessity for his departing from the well tried practice of the making of Cheddar cheese. It was, and is, a cheese eminently fitted for export purposes, capable of holding its own in the markets of Britain; palatable, nutritious and well able to furnish an adequate return for the outlay incurred by the maker. But the times are changing, and we, like the times, must change; if progress is to be maintained we must be prepared to adapt ourselves. The consumption of whole milk as such is a phase of the dairying industry which is developing by leaps and bounds. But to you as Cheesemakers and Buttermakers I do not propose to speak of the rapidly growing trade in new milk for consumption,—much as I would like to do so. *I want to remind you of that which you yourselves already feel;* that not only is the increasing population calling for milk, but a vast and profitable field is being opened, inviting the efforts of all those concerned in the manufacture of dairy products. You have established your reputation as makers of Cheddar cheese; but are you sure that the busy professional and the business man, the artisan, and those who dine in the seclusion of their own homes, are you sure that these buy and consume any appreciable quantity of the cheese we have named? The consuming public is increasing; and we are told on the highest authority that at the conclusion of peace we shall have an influx of immigration. Would it not be well to take time by the forelock and in addition to supporting most loyally the patriotism and production principles enunciated by our leading agriculturists, to prepare and make ready for the near approaching future? Do not be content to produce as hitherto, and trust that the public is satisfied. *The subject for study as never before is the study of the public taste and the market demand.* Why not begin to enquire as to what the public wants? Until comparatively recent times your public has been on the other side of the Atlantic Ocean. That public wanted Cheddar cheese. Cheddar cheese you sent. Today your public is increasingly concentrating at your own doors. Why not ask *that* public what it wants? I cannot give you figures, but the home consumption of cheese is far below what it ought to be. Do not an any account allow the making of cheddar to become a matter of history, but what the public wants is something else in addition, or something different.

W. SADLER

(To be continued)

POULTRY

SHORT COURSE IN POULTRY RAISING

A great awakening is coming in the poultry industry of the Province of Quebec, and the country is beginning to realize the value of a well kept flock of fowls. At present Quebec does not hold an enviable position as a poultry producing province since vast importations of eggs and dressed poultry are made every year, these coming from Ontario, the Western Provinces and the United States. In 1914 Quebec imported 1,103,118 doz. eggs valued at $280,429.00, and unless production within the province is greatly increased the importations will increase annually. Efforts are being made, however, to encourage farmers and town poultry keepers to increase the size of their flocks and to give them better attention in order that larger and more profitable returns may be secured. The people of the province are very favorably situated for poultry raising since eggs and dressed poultry are in constant and increasing demand and Montreal is one of the best markets on the continent. Furthermore, the province is well situated to undertake exportation of eggs and dressed poultry to Great Britain. This market is being developed gradually owing to the change in market conditions brought about by the great war. As far as supplying Great Britain with eggs and dressed poultry is concerned Quebec has a decided advantage over Ontario and the Western Provinces, but unless she takes advantage of the opportunity she will always be behind her sister provinces in poultry production. Quebec should be an exporter of poultry products instead of an importer, but this will not take place until the number of the fowls in the province is greatly increased and better methods in poultry raising are undertaken.

It is very evident, however, that Quebec is going to make an attempt to redeem herself in matters of poultry production. Greater interest than ever before is being shown by farmers and others who keep fowls. Farmers are giving their flocks better attention and there are a large number of town people who are anxious to start in the poultry business.

In order to give farmers and others a chance to acquire more knowledge in poultry raising, the Poultry Department of Macdonald College, at Ste. Anne de Bellevue, is putting forth every effort to provide a good programme for its annual Short Course, which will be held at the College from Feb. 14th. to March 3rd. This Course of three weeks is intended to assist in supplying the demand for practical knowledge, combined with a lecture course on the more important phases of poultry culture. It will be full of up-to-date information designed for practical poultry keepers and it should enable all interested to become more familiar with the principles of successful poultry keeping.

The Course is being given under the direction of Mr. M. A. Jull, B.S.A., Manager & Lecturer; assisted by Mr. S. A. Bergey, B.S.A., and Mr. A. G. Taylor, B.S.A., Assistants in Poultry Department; Mr. W. A. Brown, Poultry Division, Central Experimental Farm, Ottawa, Ont.; The Professors of Biology, Cereal Husbandry, and Horticulture; the College Veterinarian, and the Demonstrator to Homemakers' Clubs.

Men and women students will be received, but none under 18 years of age. There is no other age limit. A registration fee of $1.00 is required in advance. Rooms and board may be obtained in the Village of Ste. Anne de Bellevue at $5.00 to $6.00 per week. A list of suitable places may be obtained from the Bursar's Office. There will be no examinations for entrance or at the end of the courses. Write for illustrated bulletin to The Principal, Macdonald College, P. Q.

FEEDING THE LAYING STOCK

In my travels throughout the Province of Quebec I have found that there are four important factors affecting egg production which should be given more attention by our farmers.

In the first place there are too many poor birds upon our farms. The flocks on the average farms are small in number and the great majority of the birds are poorly bred. Good, sound stock is absolutely necessary for winter egg production. Every bird in the flock should be healthy, vigorous, and farmers will find that it is much more profitable to keep well bred stock. I do not mean to say that every farm should have a flock of pure bred birds, though this would do much to improve our poultry industry, but every farmer should endeavor to improve the breeding of his flocks through the introduction of purebred stock. Secure your male birds each year from a good breeder and stick to that source of supply from year to year. Endeavor to have a certain amount of uniformity in your flock and with this in view you should practice careful and systematic selection from year to year. It will certainly be found more profitable to have birds of light breeding; this will give you a uniform flock and uniform products in the shape of eggs and dressed poultry. Uniformity in the quality of the products marketet is what brings top prices to-day.

The second important factor affecting the winter egg production is the housing of the laying stock. Birds must be given comfortable protection particularly during the colder months of the year, and you can hardly expect your birds to lay if they are allowed to roost in the implement shed or in other places which are not conducive to good health. There are too many farms with no poultry houses on them, and there are also too many farms where the birds are allowed to roost in the stables and other places where they receive but little attention. The construction of a cotton front or open front poultry house is a simple matter and does not involve a great outlay of money, but it means a great deal in the matter of securing eggs during the winter months when the prices are high. The "*Macdonald*" and "*Tolman*" houses are two types which are giving satisfaction, and I am pleased to say that in those districts where demonstration houses have been located a number of similar houses have been constructed. I hope it will not be long before every farmer who is keeping poultry will provide for his fowls a house which is light, dry, and draught-proof.

The third important factor affecting winter egg production is the manner in which the fowls are fed and the feeds used. Maximum egg production is largely controlled by the method of feeding as well as by the nature of the foods given. One of the prime factors in feeding is to compel the birds to take plenty of exercise. The litter in the house should be eight or ten inches deep, and the grain should be scattered in this whenever it is fed. It is a good practice to stir up the litter frequently with a fork. This will prevent the straw, or whatever is used for litter, becoming packed down solid, and will also compel the birds to scratch for the grain.

The diet of the hen may be simple, but it should be wholesome; she should be given plenty of food and as much variety as possible. All foods serve various purposes in the production of eggs. Part of the food a hen receives furnishes energy to keep the body warm; another part serves to build up the tissues and organs and keep them in repair; still another part supplies material for egg production. The amount of food over and above the maintenance ration constitutes the egg-producing ration. For this purpose those foods must be given which are known to be good egg-producers.

Most of the food given to laying hens consists of whole and ground grains. Wheat, corn, oats and buckwheat are the whole grains which are chiefly used.

The practice at Macdonald College is to feed a whole grain ration of two parts wheat, two parts corn and one part oats or buckwheat, during the winter months. If the corn is cracked it will give the hens more exercise than when fed whole. This grain mixture is scattered in the litter morning and evening, and the litter is kept in such a condition that considerable scratching is necessary. Enough grain is fed in the morning to keep the hens busy for several hours. In the evening they are given practically all the grain they will pick up before going to roost. There are many poultrymen who are not able to feed their flock the proper amount of grain from time to time. On the other hand, there are some poultrymen who believe in feeding a definite quantity of grain at each feeding. It is far better to feed the birds the amount they need from time to time, and as they will eat more at one feeding than another, it is practically impossible to state definitely any specific amount which the flock should be given for each feeding. A very simple way of finding out whether the birds are being fed properly or not is to brush away some of the litter, then blow the chaff and dust away, and if corn or wheat can be seen on the bare spot of the floor, the hens are being fed too heavily. They should be made to clean everything up before being fed again.

Whole grain alone is not sufficient since the birds must balance the ration with ground grains, to which can be added certain concentrated foods. The ground grains are chiefly wheat bran, crushed oats, cornmeal and middlings. To these ground grains may be added linseed meal, gluten meal, beef scraps or fish scraps. These are concentrated foods and supply the fowls with protein, which is largely lacking in the whole and ground grains. Considerable protein is necessary for the manufacture of eggs.

It is not necessary to use all the materials mentioned in preparing a mash. At the same time the larger the variety the better the fowls like the mash and the better it serves its purpose. A good mash mixture is composed of the following:—wheat bran, 200 lbs; crushed oats, 120 lbs; cornmeal, 100 lbs; middlings, 100 lbs; beef scraps, 60 lbs; and charcoal, 20 lbs. This makes a mash which is quite palatable and which the birds relish. In place of crushed oats it may be well to use oatmeal feed, which is a by-product of the oatmeal industry and contains practically no hulls.

This mash may be fed either wet or dry. The wet mash consists of ground grains thoroughly mixed and moistened with water or sour milk, fed in V-shaped troughs at definite times. The object in wet mash feeding is really to stimulate maximum egg production.

The troughs should be kept strictly clean, and it is wise not to over-feed with wet mash. Just give the birds as much as they will clean up in a few minutes. The best time to feed a wet mash is about noon or shortly after. When wet mash is fed, table scraps, potatoes and other waste products can be mixed with it to good advantage.

If the ground grains are fed in the form of a dry mash, labor is saved. The ground grains are thoroughly mixed, and placed in a self-feeding hopper from which the birds can help themselves at any time. This is a very satisfactory method, as it saves much labor, particularly where there is a large flock, and is not so apt to be abused. The principal factor is to have a hopper so constructed that none of the mash will be wasted. Excellent results have been obtained in feeding whole rolled oats from the hopper instead of a dry mash. The oats are relished and the birds do very well on them. Whenever these oats can be secured, it simplifies the feeding problem very much.

Beef scraps have been suggested as a form of animal food. In some localities ground green bone can be obtained at a reasonable price. Where such is the case the quantity of beef scrap in the mash ration may be greatly reduced. Care should be exercised in feeding ground green bone as one-half ounce per bird per day is heavy feeding. The green bone should always be in the very best condition. Sour milk is also an excellent animal food; it is one of the best poultry foods we have, and should be used more extensively. Its cost is low, and in addition to being a valuable egg producer it tends to keep the hens in good health. One of the most profitable ways in which sour milk may be used is in feeding it to laying hens.

While the birds are confined during the winter months some form of green food is absolutely necessary for best results. Give the birds mangels, turnips, or sprouted oats. Alfalfa or clover hay, if well cured, may be fed. Mangels are cheap and are easily grown, and the birds will consume large quantities of them. Sprouted oats also make an excellent form of green food. The method of sprouting is simple. Take the quantity of oats desired, soak them in lukewarm water for twenty-four hours, then spread them out on the floor of a fairly warm room, or place them in flat boxes so that the oats will spread out in a layer about one inch thick. Keep them moistened and stir them to prevent moulding. When they start to sprout do not disturb them, and when the sprouts are about three inches long the oats may be given to the birds. Some form of green food should be supplied the birds every day. In feeding mangels it is a good practice to drive a spike into the wall about sixteen inches above the floor, and on this the mangels can be placed.

Oyster shells and grit should be kept before the birds at all times. Grit seems to aid digestion, and oyster shells supply the fowls with material from which they make egg shells. The egg shell is largely composed of lime, which is secured from oyster shells.

Clean water is also necessary. It is very important to see that the birds are never without water, for an insufficient supply often causes a serious decrease in egg production. Where sour milk is available it should be used, and it will largely take the place of water. It should be given in a thick condition.

Finally, it should be borne in mind always that apart from the kind and quality of foods given, the method of feeding has much to do with egg production. The laying hen must be kept as busy as possible. It is the busy hen that lays best Exercise means eggs.

M. A. JULL

QUEBEC'S OPPORTUNITY IN POULTRY RAISING

THE Province of Quebec has a great opportunity to become one of the foremost poultry producing provinces of the Dominion. Conditions effected by the great war have altered the market situation in Canada to such an extent that Quebec is placed in a very advantageous position. Heretofore the province has been importing eggs and dressed poultry in large quantities every year. In 1914 eggs to the amount of 1,103,118 doz. were imported. These came from Ontario, the Western Provinces and the United States. Though egg production within the province has increased during recent years it has been necessary to import because of the increased demand. The increased demand for eggs and dressed poultry has resulted from an increase in population in the cities of the province and from a very large demand on the part of the public for eggs and dressed poultry. People are now eating about four dozen eggs per individual every year more than was the case nine or ten years ago. There are two factors, then, responsible for the greatly increased demand for eggs, the first of which is the increase in the consuming population and the second the increasing demand resulting from improvement in the quality of eggs marketed. The producer, however, has not taken advantage of these factors with the result that the production of eggs and poultry on the farms of the province has not kept pace with the constant and increasing demand. Thus, large importations are made annually; such importations really amount to a loss to the province. In 1914, for instance, the farmers could have saved to themselves $280,429 worth of eggs, this sum being the value of the importations for that year. The fact that importations are made annually is proof that the farmers of Quebec have not taken advantage of the good markets within the province. Montreal is one of the best poultry markets on the continent, and if the farmers are prepared to market eggs and poultry of good quality good prices may be secured. This is one fact which many farmers often overlook. The average condition of the eggs and poultry marketed in Quebec is far from satisfactory and this affects the general price for all poultry produce. Comparatively few of the eggs produced on the farm of the province are marketed in towns and cities as fresh eggs because it takes the eggs too long to reach the consuming public. This is the fault of the method of maketing and can be overcome to a great extent by cooperative action on the part of the farmers. I have seen some dressed poultry offered on the market

Single comb Rhode Island Red cockerel.

of Quebec which was hardly fit for human consumption. In many cases the dressed birds are extremely thin; sometimes the crops are full of food; and the birds are badly prepared for market. Much more attention needs to be given to the question of marketing before farmers will receive good prices.

One feature, which has been brought to our minds as a result of altered conditions resulting from the war, is the fact that Canada is now exporting eggs to Great Britain, which she has not done for a number of years. For many years back Canada has imported large quantities of eggs annually and our exports have been decreasing. Most of the eggs exported went to the United States. At present there is a great scarcity of eggs on the British market and British buyers are calling for Canadian eggs. Most of the Canadian eggs for export have come from Ontario and the prairie provinces. Quite a number have come from the United States, in which case they have been purchased by Canadian buyers, repacked in Canadian egg cases and shipped to Great Britain. The first two or three shipments of American eggs were shipped as Canadian eggs but this objectionable feature has been overcome and buyers are shipping American eggs as such, merely labelling them as repacked in Canada. The significant fact in regard to Canadian exportations of eggs is that practically none have come from Quebec, although most of the shipments have gone through the shipping points of Quebec. Such a condition of affairs is a reflection upon the producers of our province and it will be realized that a valuable market and much money are being lost. In regard to the exporting of eggs Quebec has the advantage over the other provinces because we have practically no transportation problem. The eggs could be shipped from Montreal whereas all eggs from Ontario and the West, consigned to Great Britain, must be shipped eastward to Montreal; consequently the farmers of Quebec should take advantage of the situation and should endeavor to produce eggs for export besides supplying the province's requirements.

White Wyandotte cockerel.

Barred Plymouth Rock cockerel.

Another feature of considerable importance which our farmers should bear in mind is that any surplus produced above local requirements will find a ready market in New England. The Eastern Townships could ship considerable quantities of eggs to Boston and even to New York. On such markets good prices can be secured for good quality stuff, and Canada should export nothing but her highest quality. An increase in the production of eggs, however, will only result when a larger number of fowls are kept in the province. The average number of fowls per farm should be increased to at least 100 or 150 since at present the average farm flock is too small. The birds are usually only fairly well bred and there are comparatively few purebred flocks throughout the province. The Poultry Department has recently made an investigation of 120 farms in Pontiac County, and in this survey only 20 farmers were found to be keeping purebred fowls. A larger number of fowls per farm and better breeding stock will do much to increase egg production. On many farms the birds are poorly fed, although in Pontiac County we found that the farmers were doing much better than usual. On many farms plenty of grain and other feed material is available and it should be pointed out that the average farmer is able to feed his fowls much more cheaply than where all feeds have to be purchased.

Housing conditions should also be greatly improved. Fowls cannot be allowed to roost in an open shed and be expected to produce eggs. They must be given comfortable quarters and proper care and attention. Inexpensive cotton front houses can be constructed which will keep the birds comfortable and give satisfaction. It has been found that quite a number of "Macdonald" and "Tolman" houses have been constructed in different parts of the province as a result of the establishment of demonstration houses. The matter of housing is very important, since winter egg production is the most profitable phase of the poultry industry, and fowls must be given comfortable protection before they can be expected to lay during the colder season of the year.

In conclusion, it may be pointed out that it costs but little to make many of the necessary improvements in connection with the proper management of the farm flock. The returns are immediate and regular and the farm flock is of far greater value than the average farmer realizes. If fowls are kept at all they should be given proper care.

M. A. JULL

WOMAN'S WORLD

TRAVELLING LIBRARY — QUEBEC HOMEMAKERS' CLUBS

By Miss F. Campbell

We send out at present from the School of Household Science, Macdonald College, for the use of the Quebec Homemakers' Clubs, four libraries of thirty-five volumes each, twenty-four of which deal with subjects pertaining to household science and the remainder are standard works of fiction, poetry, biography, etc.

The books are sent out in cases, a photograph of which, with a description, is here given. As the books are different in size in each library the case for each is slightly different. The books for each library were first arranged in position, then carefully measured and the case made to suit the dimensions.

These cases are sent out express prepaid from the College to a club, on condition that one member of that club acts as librarian, becomes responsible for the books, and sends them on to another club, prepaid, at the end of three months.

A library record book is sent in each case. The key of the case and a form to be filled in and returned to the College, when the library is passed on to another club, are mailed to the person who has agreed to act as librarian.

Since this system was established only at the beginning of October, we have yet to learn to what extent it will be taken advantage of. At the end of a year the libraries will be called in and note made.

Besides the travelling libraries, a circulating library has been established, consisting of government bulletins and magazine clippings, which are filed away in folders (numbered) and are indexed and classified by the card system. These bulletins and clippings are for the use of the clubs in preparing programmes, etc. Any member may be sent the literature required on condition that it is returned within two weeks according to the instructions on the envelope in which it is mailed.

The following is the form to be filled in by a club when returning or forwarding library to another club:—

TRAVELLING LIBRARY—QUEBEC HOMEMAKER'S CLUBS

1. Name of Club .. ..
2. Date Library was Recevied .. ..
3. Library Number .. ..
4. Person Responsible .. .. .. (Address) .. ..
5. Sent on to .. ..Club.. .. ..
6. Date sent on .. ..
7. Remarks .. ..
8. I hereby certify that this Library left here with no books missing, and all, apart from reasonable wear, in good condition.

(Signed)

Note:—In the event of a missing or damaged book, fill out the form below and score out No. 8.

9. Books Missing .. ..

(Signed) .

10. Books Damaged .. ..

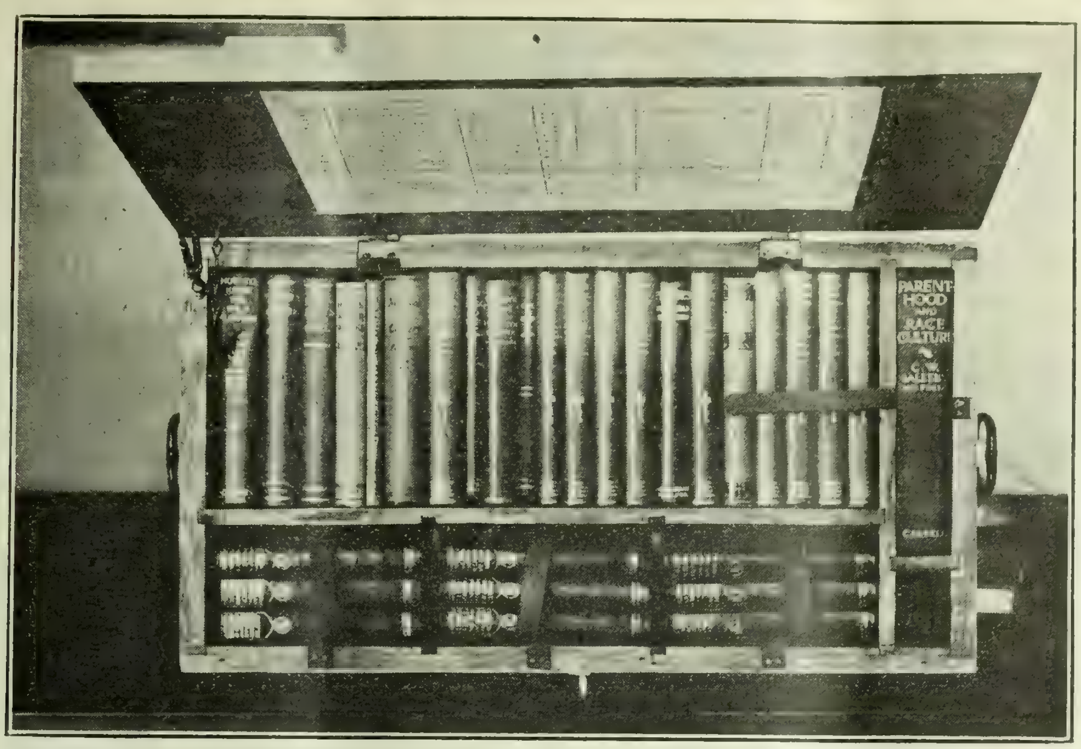
(Signed) .

Please return this promptly to:—

Miss F. E. Campbell,
Demonstrator, Q. H. C.,
Macdonald College, Que.

Date... ... ...

The following are specimen copies of sheets in the Record Book of Travelling Libraries:—



TRAVELLING LIBRARY NO. 4 MACDONALD COLLEGE.
Outside Dimensions—26 L. x 14½ W. x 8¼ H. List of Books and No. of Library pasted to inside cover of box. Leather straps for raising books out of their snug-fitting niches. Made of basswood, painted and fitted with handles and padlock.

NOTE

Pasted inside the box containing the books will be found a copy of the books in Library 4.

In the envelope pasted to the inside back cover of this book will be found lists of books in Libraries 1, 2 and 3.

The box in which the books are packed serves also as a cabinet while the Library is in use.

IMPORTANT

Some person (Secretary of Club will arrange with Demonstrator before Library leaves Macdonald College) in each Club having the Library must undertake to be responsible for it during the period it is held by the Club. This person:—

1. Must record in this book (in place indicated) when the Library was received and returned, and sign for same.
2. Must keep this book up-to-date entering *every* book that is taken out, whether only for a day or longer.
3. Must see that all rules are strictly complied with.
4. Must check off books with list on receiving and before returning Library.
5. Must see that the Library is kept only *three months* and must make all arrangements with Demonstrator in regard to receiving and returning it.

LIBRARY RULES

In order that this Travelling Library may serve the members of the Quebec Homemakers' Clubs to the fullest extent, in the most satisfactory manner, it is important that each Club member shall observe the following:—

1. The Library shall be retained for three months by the Club to which it is sent.
2. Books must on no account be taken from the Library without a detailed record being made in this note book — in the place provided for this purpose.
3. Each Club member is allowed one book from the Library at one time.
4. Books may be retained for two weeks. The time allowed may be renewed, unless the book has been asked for by someone else. It will be a great convenience to others, however, if books are returned promptly when read.
5. All damage done to books beyond legitimate wear, shall be paid for by the person to whom the book was loaned.
6. If a book is lost it must be replaced by the person to whom it was loaned.
7. Marking of books in any way is strictly forbidden.

CLUBS THAT HAVE HAD LIBRARY 4.

Date Received.	Name of Club.	Person Responsible.	Date Returned.

BOOKS TAKEN OUT—LIBRARY 4.

Date Taken.	Title of Book.	Accession Number.	By Whom Taken.	Date Returned.

THE CARE OF GOLD FISH

THOUSANDS of gold fish are imported annually into Canada, and many homes are brightened by a globe or tank of them, but very little is known in regard to their care or the arrangement of an aquarium. Of all living creatures we know of none that require so little care as gold fish; the initial cost is very low, as is the cost of maintenance. The gold fish appear wild for a time, but after a while they become semi-domesticated and well feed out of one's hand when they are acquainted with the person who feeds them.

There are many aquariums on the market, including globes, and square and oblong vessels. It is a matter of taste as to which is purchased; to accommodate two or three fish the globe is satisfactory, but to keep several fish it is necessary to have a large tank. Gold fish kept in small jars or globes require the water changed at least once a week. The necessity for this can be determined by watching the fish for a few minutes; if they come to the surface and swim about with their mouths open, gasping for air, it is a sure sign that the water must be changed. Fish breathe the air just as do human beings, the gills of the fish are so constructed that it can breathe the oxygen contained in the water. Nature has provided a way of replenishing the supply of oxygen by placing plants in the aquarium. The plants transform the poisonous gases into fresh air for the fish.

A globe holding one gallon of water is best adapted for the aquarium; it should be about three-fourths full, for if it is full of water the fish are apt to jump out. The water should be of the same temperature as the room; never use warm water as it does not contain the same amount of air as cold.

All globes and tanks should have some form of shelter for the fish; oddly shaped stones or quartz crystal make useful ornaments. All dealers in aquarium supplies keep some form of aristic arrangement. Tadpoles, snails etc. will keep the water clear for quite a long time.

Fish obtain a certain amount of food from the water, but not enough to sustain life, so they must be fed, but do not get the idea that fish are always hungry. More fish die from over-feeding than from any other cause. A staple food is sold by all dealers in goldfish, but nothing is so good as the white wafers. Each fish should have every second day a piece of white wafer about the size of a five-cent piece.

Fish should not be handled but should always be transferred with a net which can easily be made with a little cheese cloth and wire, allowing it to bag about three inches in the middle. Aquariums should never be placed in the sun or near any heating apparatus, as gold fish like cold water, but aquariums with growing plants require all the light possible.

To arrange plants in the aquarium is very simple. Place about three inches of sand in the bottom of the tank. Then collect some aquatic plants which can be found in fresh water ponds and brooks — such plants as ribbon grass, arrow head, water weed, water cress or any others growing in the locality can be planted in the sand. Some kinds can be left floating in the water. Oddly shaped stones should be placed over the sand; these will help to hold the plants in position.

E. H. JONES

Lecturers on Farm Home in the series of Short Courses given by Macdonald College, at nine Centres during January.
Standing are:— Miss Hill, Miss Campbell and Miss Zollman.
Sitting are:— Miss Fisher, Miss Philp and Mrs. Rutter.

OF GENERAL INTEREST

PRECEDENTS

FARMERS are disposed to make a great deal of fun of lawyers, many of whom seem never to know what is right and just until they have looked through dusty volumes to find out what somebody else said or decided in a like case a hundred years ago, or two hundred, and possibly in some other country or under other conditions. And the lawyers deserve what they get; for law as administered is firmly welded to the past by precedent, and only the clearest heads and the most courageous and honest men have enough force of character to break precedent because conditions and circumstances are different, and make decisions as nearly as possible according to justice and equity.

But all farmers are not in a position to throw stones at the lawyers. We, too, are victims of precedent; and occasionally we find a man honest enough to admit it by quoting the old maxim: "As our fathers did, so do we". We cling to old methods of plowing, for example, without stopping to consider the reason why we plow. We cling to old methods of planting corn, because we have precedent for it: "That's the way father did it". "That's the way it has always been done".

We looked askance at the automobile, and threatened dire vengeance on chauffeurs who drove along the highway and frightened our horses. The horse does not depend on precedent, and soon learned that the automobile was harmless, something not to be feared even at night, its eyes gleaming like balls of fire.

We cling to precedent in our dairying. The heifer bore a calf, as was her mission, and we milked her if we needed the milk. But Babcock introduced a new thing in his test, and while he gave it free to the public, we don't like to break precedent by using it. We have always grown one variety of wheat, and rather look askance at a new variety, even if sent out by the experiment station. We hesitate to buy more than a bushel or two, for fear we may be the victim of a fakir.

We are looking askance at the tractor, and fear that it is going to interfere with our business of growing horses for sale. But it is worth while to look into this matter carefully, and study it, and see whether it may not be profitable, and whether it does as good work as horses. It is worth while to figure how much it costs us to keep our horses, how much we really get out of them, and whether they increase or decrease in value, and whether we would get more out of the tractor. But even here we must be careful; for there are tractors and tractors, and there are farms and farms. There are large farms and small farms, level farms and hilly or rough farms. All these things are factors which must be taken into consideration before we determine whether we will break precedent or not.

We were taught in a one-room school—our children are taught in the same kind of a school, by a teacher whom we never pay what she is really worth. It is worth our while to inquire whether we can not get better results by combining two or three schools or more, and supplying teachers with buildings and appliances that will enable them to do the best work for the pupils.

Don't despise precedent, but study it, and find out the reason for that precedent, and whether that reason exists any longer, or whether there is a better way.

It has long been a custom among farmers to use patent medicines for all the ills to which flesh is heir. It is time we should break this precedent and cease to be humbugged, even if the advertisement does appear in some religious paper. It is time for us to inquire into the causes of disease, and how far it is in our power to remove the cause. Then, when sickness comes, get the best physician in the community. Pay no attention to men who profess to cure every disease; for doctors don't cure disease. They simply assist nature, and give us some help in overcoming the mistakes of the past. They should teach us how to keep well.

Don't despise precedent on the one hand; don't worship it on the other. For you are a farmer; and there is no business or profession that requires a higher rate of intelligence and more careful study of the causes and reason for things than does farming.

Wallaces' Farmer

PREPAREDNESS

NOW that in every field of human endeavor there is coming to be a greater specialization, now that every form of activity proceeds according to established laws and principles; now that success in any line depends upon a knowledge and proper application of these laws; it is no longer possible to meet the brutal competition of business successfully without careful and systematic preparation.

Agriculture, once looked upon as the occupation to which every man might turn when he had failed at everything else, has become a business in which to succeed, a man must have a thorough preparation.

No young man would presume upon his native ability to carry him through the practice of law or medicine; none would believe that in any of the arts or trades requiring the exercise of real skill, he could bluff his way through. Even in the work of the teamster, the digger of ditches, and the driver of railroad spikes, there is a best and most economical way to do the work, which must be learned from one who knows, or by the long and wasteful process of repeated failures. Yet, knowing all this, knowing that in every element of the business of life, there is need of preparation, how many young men there are who take up this business of life entirely without preparation.

With opportunities such as were never before offered for acquiring a thorough working knowledge of the principles underlying any art, craft, or trade he may wish to pursue, we see the young man idling away his time, and finally driven to take up some occupation for which he has made no preparation.

An observant man scarcely passes a day of his life without meeting with some one who has a tale of woe to recite of how everything he undertakes ends in failure; how "luck" is always against him; and how he can not understand why others succeed while he, working much harder, always fails.

In the very great majority of cases, there is no mystery; the whole explanation lies in the fact that he who always fails, is always undertaking a work which he does not understand, and for the understanding of which he neglected to prepare himself.—

SUNSHINE A GERMICIDE

Tests Show That Germs of Disease Can Not Survive When Exposed to the Sun

SUNSHINE is an amazingly potent germicide for the farm housekeeper and in the dairy and stables. The practice of exposing cooking and other utensils used in connection with food to direct sunlight makes use of this fact, although comparatively few appreciate exactly the work done by the sun in this regard. Probably only those who are acquainted with tests which have actually been made realize how quickly sunshine kills disease germs exposed to it. Hence the following tests may be generally instructive and interesting.

A pasty, creamy mass of tuberculous material, which was proved to contain uncountable numbers of virulent tubercle bacilli, was obtained from a tuberculous cow and spread in thin smooth translucent layers on sheets of glass, pieces of wood, and strips of muslin. Some of the sheets of glass, pieces of wood, and strips of muslin were then placed outdoors on a moderately warm, clear, calm day where the sun could shine on them, and an equal number were placed in a dark room. After 15 minutes exposure to the sun, the tuberculous material on the glass, wood, and muslin still contained large numbers of living, virulent tubercle bacilli, which were proved to be fully capable of causing tuberculosis, but after 30 minutes exposure to the sun no living tubercle bacilli could be found; every test that could be made proved that they were all dead.

Similar tests with quite large opaque masses of tuberculous material,

Better Butter— Bigger Profits!

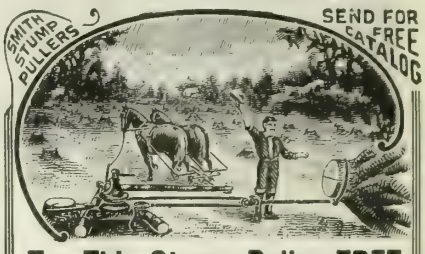
If you wish your butter to be smooth and uniform, use the

"BRITISH" Butter Worker

Adopted by the best dairies in Gt. Britain and Canada. Makes the butter firm—even—consistent all through. Results in better butter and bigger profits!

Sold by dealers everywhere. Three sizes — 14 in., 17 in. and 20 in. wide.

MAXWELL'S LIMITED, St. Mary's, Ont. 4



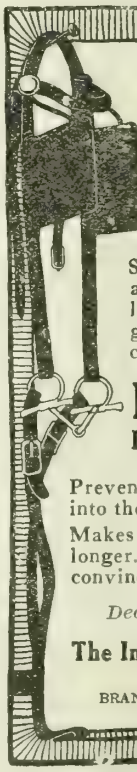
Try This Stump Puller FREE

We want a Smith machine on every stump and timbered farm in the country; **it will clear from one to three acres a day, pulling the largest stumps and trees quicker than the holes can be bored for dynamite.** The Smith Stump Puller will transform your waste lands into the most productive, while the first crop on one acre will more than pay for the machine.

Our Three Year Guarantee

We give you a guarantee to replace any casting broken on the Smith machine for three years from date of purchase. **Our catalog tells you all about it, shows why the Smith Stump Puller is the most profitable implement made for farm use today, and explains our Special Introductory Offer and our Free Trial Proposition.** Send us your name and we will send it free.

W. Smith Grubber Co.
32 ***Smith Sta., La Crescent, Minn.***



Good Looking Harness

Stays good looking—and old harness looks like new when you give it regular applications of

EUREKA HARNESS OIL

Prevents cracking. Puts life into the harness.

Makes it strong, pliable, last longer. One application will convince you.

Dealers Everywhere

The Imperial Oil Company Limited
BRANCHES IN ALL CITIES

YEARLY SUBSCRIPTION TO THE "JOURNAL OF AGRICULTURE" IS **ONLY $1.00.** IT IS WORTH TEN TIMES THAT AMOUNT TO THE FARMERS' HOME.

larger and denser than any tuberculous person is apt to expectorate, proved that the bacilli in such masses on glass are still alive after 4, but entirely dead in less than 8 hours, and still alive in the material on wood and muslin after 8, but dead in less than 16 hours.

The tuberculous material in thin layers on glass, wood, and muslin, kept in a dark room, was proved to contain fully virulent, living tubercle bacilli after 30 days. The contrast is remarkable, tubercle bacilli of the same kind, on the same kind of material, dying in a smaller number of minutes in the sunshine than the number of days they remained alive in a dark room.

As most varieties of disease germs are more easily destroyed by germicides than tubercle bacilli, and as tubercle bacilli, in the thin layers in which they are likely to adhere to clothing, blankets, rugs, draperies, furniture, walls, floors, etc., are killed by the rays of the sun in less than half an hour, though they remain alive in dark places a month and longer, it is reasonable to draw the following conclusions:

(*a*) As a general sanitary principle it is desirable that all dwellings, stables, etc., should be so constructed that an abundance of sunshine can reach their interiors.

(*b*) As a general protective measure against disease germs, it is an excellent practice to expose utensils for handling milk, and milk cans after they have been cleaned, to direct sunlight, and to hang or spread wearing apparel, blankets, bedding, rugs, horse blankets, etc., periodically where the sun can shine on all parts of them.

WHAT HINDERS PROFIT IN DAIRYING

THE main thing that hinders profit in dairy farming is poor cows. By that we mean keeping a lot of cows which do not pay any profit on their keep. If the average cow farmer could be induced to enter upon a vigorous campaign against himself and his lack of good cow sense, as well the poor cows that he insists upon keeping year after year, there would be a revolution in this cow business. Put the question any way you please and it comes out the same:

1. We never yet saw a herd of cows of high average quality that did not pay a profit. Did you?
2. We never yet saw a herd of low producing cows, no matter what their breed, that paid a profit. Did you?
3. We never yet saw a dairy farmer who resolutely set to work to cull out and grade up his herd but that made money by it. Did you?
4. We never yet saw a dairy farmer who let things run along in a loose, unsystematic manner; who would do nothing to bring up the standard of production in his herd; who made any money in dairying. Did you?

Put these questions together; apply them to the situation as it exists on your farm and about you. Deduce from them what you should do to raise the standard of profit and you will find yourself doing a lot of things that help that are not mentioned here. Start the farmer to looking at the question of profit from the right standpoint and he must be a dull man who can not then improve his condition.—*Hoard's Dairyman.*

THE STRONG POINTS OF LIVE-STOCK BREEDS

IF farmers in Canada were all Canadian-born, and if such a thing were possible that they should all have similar ideas and ideals, then horses, cattle, sheep and swine might be represented by one breed in each class. So long as we have different nationalities, languages, creeds, religions and politics is it any wonder that stockmen cannot agree as to any one all-superior breed of live stock? We doubt if one breed of cattle, for instance, even of beef type, could supply the requirements of all farmers, and, furthermore, it is altogether probable that the adoption of a national or all-Canadian breed of any class of stock would militate against the best interests of the live-stock industry. We may have too many breeds but, if so, we have too many ideas, too many requirements and too many different conditions. Upon these latter phases of Canadian farm husbandry the number of breeds depends, and with only one or two exceptions, a strain or a breed niches in to fill a gap where another breed falls down. It may be said, however, in all truth, that we have a few breeds that have either been fostered by unprogressive men who are not interested in making their type of animal useful under particular conditions, or the breed itself is unsuited for the Canadian farmer. In some cases the breeds were probably introduced as a fad or to have "something different." In any case they are making little headway, and in no way do they influence the industry at large. There is a place for the different breeds with which we are familiar; to know them and their characteristics is to appreciate their existence. While their history and development brings home to all the importance of each strain, and its relations to the industry, space will not permit of a detailed review here, but a few points relative to each will distinguish the different breeds and explain their presence in Canada.

HORSES

There can be no misunderstanding as to the importance of the different breeds of light horses. Each one satisfies some demand, but there might be some doubt as to the necessity of four well-established breeds of heavy horses. Why is not a draft horse a draft horse? Why do some prefer one breed to another for draft purposes when each breed is supposed to measure up to all requirements. To John Paterson, of Lanark County, Scotland, is given much credit for using a Flemish stallion on Scottish mares and producing the foundation stock

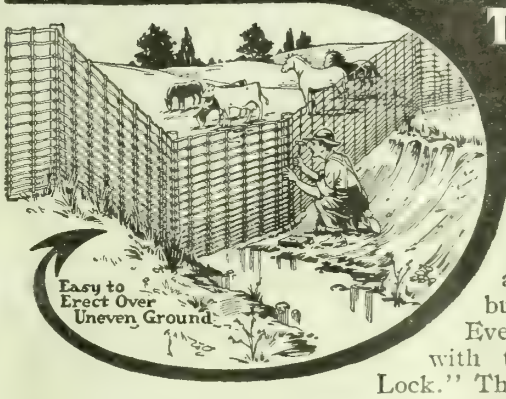
You can't beat
Old Dutch

for taking rust and
stains off knives

RENNIES SEEDS

PUREST-CLEANEST
MOST RELIABLE
GET CATALOGUE
AT BEST DEALERS
OR DIRECT
190 McGILL ST.,
MONTREAL, QUE.

PEERLESS PERFECTION
THE FENCE THAT STAYS "PUT"



PEERLESS Perfection is one of the easiest fences to erect, because it stays "put." It can be erected over the most hilly and uneven ground, without buckling, snapping or kinking. Every joint is locked together with the well-known "Peerless Lock." The heavy stay wires we use prevent sagging and require only about half as many posts as other fences.

Peerless Farm Fence

is made of the best Open Hearth steel fence wire. All the impurities of the steel are burned out and all the strength and toughness left in. Makes the fence elastic and springy. It will not snap or break under sudden shocks or quick atmospheric changes. Our method of galvanizing prevents rust and the coating will not flake, peel or chip off.

Send for catalog. It also describes our farm gates, poultry fencing and ornamental fencing.

Agents nearly everywhere. Agents wanted in unassigned territory.

The Banwell-Hoxie Wire Fence Co., Ltd.
Winnipeg, Manitoba Hamilton, Ontario

for the Clydesdale breed. Undoubtedly Shire blood was also used in the beginning, but later the breed has been maintained comparatively pure, for the Scottish farmer preferred perfection in the feet and legs to a heavy, compact body, and to us has come the modern Clydesdale with trappy action, clean bone and more quality than was found in the original stock. In Canada Clydesdales outnumber other breeds of heavy horses, but largely on account of a sentiment that will live long where the blood of Old Scotia flows in the veins of the people. An unbiased writer says regarding Percherons, "The legs and feet are quite distinctive of the breed. No more shapely and well-developed feet are found on any draft horse than on the Percheron." The observations upon which the statement is based were probably made in France and the United States, but western Canada too is producing a better representative of the great French breed than are we in the East. Altogether the Percheron is a big, drafty animal, strongly coupled, with no feather on the legs, a feature that recommends the breed to many. The Clydesdale leads in Canada, the Percheron in the United States; why, only advocates of either breed can satisfactorily explain. Many prefer the Shire because of the heavy frame and body and ability to move extremely heavy loads. The Belgian is reputed to posses a maximum of weight within a given space, and though somewhat slow in action its great weight and strength make for it many friends. Canadians have staked a good deal on quality; the breed that can show that attribute to the best advantage has a promising future indeed.

BEEF CATTLE

Cattle are kept for milk or beef while some breeds are reputed to be serviceable for both. Beef and dairy breeds are numerous, and here again it might seem strange that so many different types are required to supply practically the same demand. However, there are some peculiarities of type, some characteristic, some predominating feature in each that recommends it to the stockman. The great number of Shorthorn, or Shorthorn grades throughout Canada is the best recommendation a breed can possibly have. So thorough, so farseeing and so correct in judgment were the Colling Bros., Bates, the Booths, and Amos. Cruickshank in their breeding methods and aims that we have in the breed that tendency to flesh that feeders admire, and the name of Bates is still coupled with the milking propensities of the Shorthorn which elevate them to an unchallenged position among other beef breeds in this regard. The cows make excellent mothers, and if a cross is desired for early maturing qualities or grazing purposes the Shorthorn dam is still in high repute.

Through size, quality of flesh, and superiority as a grazer the Hereford is fighting for "a place in the sun." John Hewar, one of the early English breeders, laid particular emphasis on scale, quality and uniformity of color. In these traits the breed ranks high, but Herefords are especially desired on the ranch or where grazing is an important consideration. Feeders also admire the white-faced steer for the stall or feeding runs, even though it show Shorthorn development. The Hereford and Shorthorn blend well for this purpose.

Aberdeen-Angus cattle are fast growing in public favor. Since the baby-beef industry has passed through the period which might be termed the incubation and has become an established practice, one is able to see an Aberdeen-Angus bull as head of a herd of good grade or pure-bred Shorthorn cows on many farms. The Angus in the pure is also used for this purpose because of early maturing qualities, superiority of flesh and reputation as good feeders which are annually bringing more breeders to the Angus standard. Their enviable records in killing tests, the numerous championships won at the Chicago Fat Stock Exposition, and their performances in the show-ring elsewhere have placed them in a position that is hard for other breeds to attain.

In their native country the Galloway is looked upon with considerable favor. They are hardy and good beef makers. In 1853 these cattle were introduced into Canada, and other representatives of the breed came over in 1861. Although they have been maintained and bred in this country for over half a century Galloways often appear at our largest exhibitions, unfitted and represented by only one herd. We are not prepared to say that they are not suited to Canadian agriculture, but it does not speak well for the breed to see them making such little progress. They have been here longer than some of the other breeds, but in all that time they have not developed enough or become well enough known to be considered rivals of the Angus, Shorthorn or Hereford.

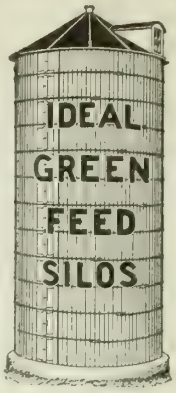
DAIRY CATTLE

Of the dairy breeds there are four recognized in the Dominion to be worthy of a place, the Guernsey is bred more extensively in Eastern Canada than in Ontario or in the West, but they have not gained the importance attributed to either the Holstein, Ayrshire or Jersey. The first mentioned, namely, the Holstein-Friesian, originated on the plains of Holland. The country is generally fertile, the climate mild, and they were bred for size and great production. With us they are still the great producers, and although their records of performance are almost beyond belief the maximum is not yet reached, for their ability to produce appears unlimited. For the dairyman with a fertile farm who is prepared to feed liberally and wisely they are especially suited. The calves are large and if not desired for breeding purposes make estimable veal. Ayrshires, too, rank high in ability to produce, yet they were developed under more severe conditions. Grazing on the hills of Scotland, they became accustomed to a more rigorous climate and less liberal rations. They will thrive where

Ideal Green Feed Silos

IT isn't too early right now to plan for the erection of a silo next summer.

The more you investigate the advantage of having succulent silage to feed your cows all winter, the sooner you will decide to erect a silo; and if you thoroughly investigate the silo question you can scarcely escape the conclusion that the Ideal Green Feed Silo is the best silo for you to buy.

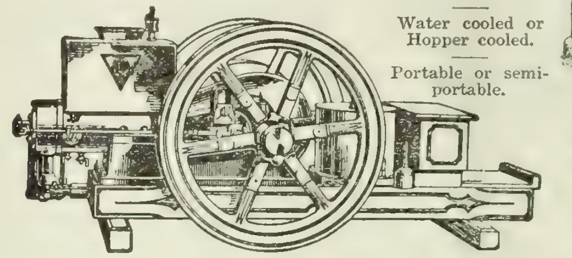


"Alpha" Gas Engines

2 to 28 H. P.

Water cooled or Hopper cooled.

Portable or semi-portable.



Uses all fuels.

Easy to start.

Equipped with magneto.

Develops full power.

The most convenient reliable and economical power for the farm, dairy, creamery or shop

THE "ALPHA" Gas Engine is the highest grade and most reliable engine that you can buy for any purpose whatever; but on account of its simplicity of construction and reliability of operation it is unusually well adapted for farm use.

Catalogues Mailed Upon Request to Nearest Office

DE LAVAL DAIRY SUPPLY Co., Ltd.

LARGEST MANUFACTURERS OF DAIRY SUPPLIES IN CANADA

Exclusive Canadian distributors of the "World Standard" De Laval Cream Separators

MONTREAL PETERBORO WINNIPEG VANCOUVER

In every nook and corner of the farm, inside and outside of every building, in every field and at every turn of the lane there's a picture that should form a part of your

KODAK RECORD

Such pictures add interest and *value* to your written record. The making of Kodak pictures is very simple, and is less expensive than you think.

Catalogue free at your dealer's, or by mail.

CANADIAN KODAK CO., Limited, - 604 King St. W., Toronto.

SELL YOUR MILK

MANY a farmer who would like to raise his calves is prevented by the amount of milk necessary to feed them. By raising them he could select the best of the stock and improve the standard of milk or beef production of his herd.

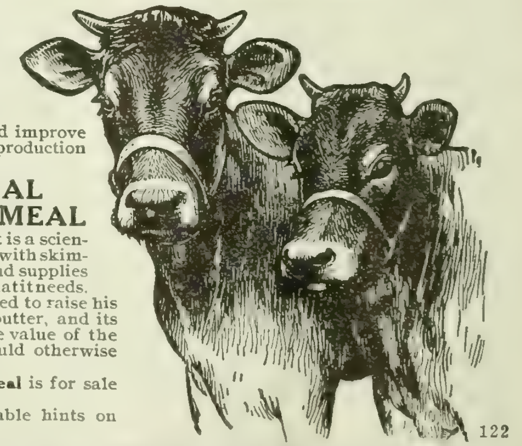
INTERNATIONAL GROFAST CALF-MEAL

solves the problem for him. It is a scientific preparation which, mixed with skim-milk, takes the place of milk and supplies to the calf every food element that it needs.

By its use the farmer is enabled to raise his calves and sell his cream or butter, and its cost is a trifle compared to the value of the whole milk that the calf would otherwise need.

International Grofast Calf-Meal is for sale by dealers everywhere.

Write for our book of valuable hints on raising calves—free.



122

INTERNATIONAL STOCK FOOD COMPANY, LIMITED, TORONTO, CAN.

the Holstein does not do so well and give good returns and satisfactory profits. In the early days considerable stress was laid upon the conformation of the udder, and the efforts of former breeders in this regard is still evidenced in the Ayrshire breed, for no other dairy cattle carry an udder so correctly placed with quarters so near perfectly balanced. This feature of the breed is still important, while the breeders are striving for more scale, larger teats, and greater production.

On the Island of Jersey in the Channel Isles, a breed has been developed and kept pure for probably a century and a half. These cattle bear the name of the Island itself, and over 40,000 head are kept annually on an area of a little over 28,000 acres. Although not so rugged as the Ayrshire or such great producers of milk as the Holstein, they are reputed to give good financial returns with less labor. In quality of milk they are perhaps supreme. In ability to reproduce they rank among the best, and a breeder has little trouble with them at the time of parturition. For the man with a small farm or for the man who only wishes to keep one cow they are a very popular breed, yet as a recognized and standard breed of cattle for the dairy business they have a widespread patronage.

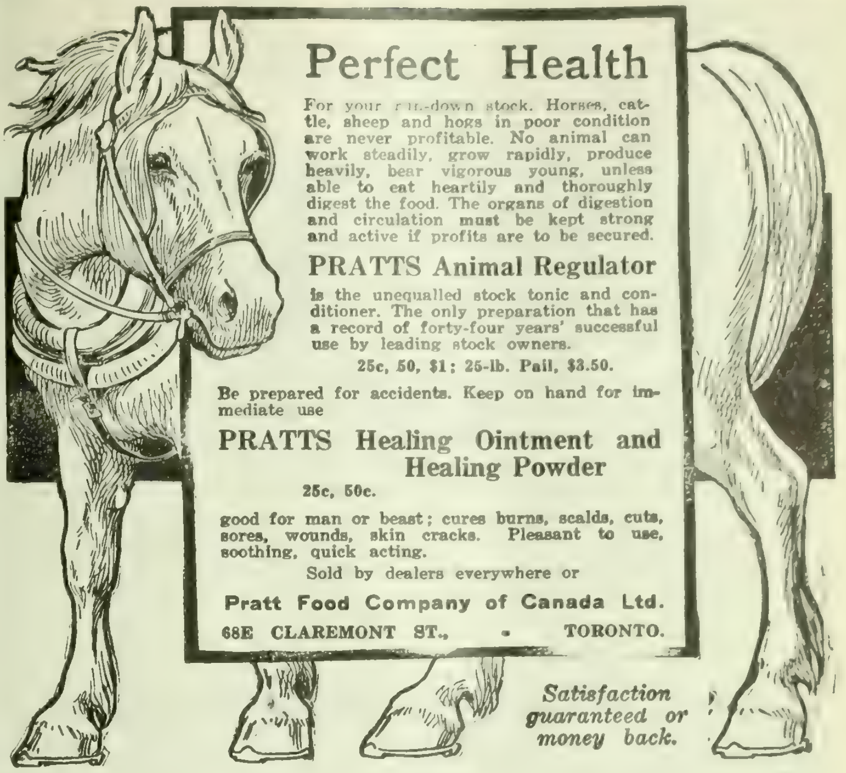
In Quebec the French-Canadian cow has grown into popularity. Under conditions unsuited for many of the other strains of dairy cattle they still continue to do well, and although they do not show the uniformity of type and conformation possessed by other breeds exhibited at our larger fairs they are popular with the habitant, and have a future.

SHEEP

Many of the differences and qualifications to be found in beef cattle appear also in the sheepfold. However, a sheep has a dual function to perform which divides that class of live stock into two categories, viz., mutton and wool breeds with some that conform fairly well to both requirements. As a mutton type the Southdown now ranks pre-eminently high. Although individuals of the breeds are not large in size the mutton holds premier place in the discriminating markets, and at the present time when small cuts are in favor Southdown mutton meets with ready sale. As a feeder the Southdown is considered superior. They adapt themselves tolerably well to conditions, in breeding qualities they are about average, but as producers of wool the breed occupies a subordinate position. Another general-purpose sheep is the Southdown, and almost equals it in Shropshire, which is heavier than the quality of mutton. Cross-bred or grade Shropshires are most common on the market, which proves the adaptability of the breed to different localities, and substantiates the claim that they do well when crossed upon ordinary farm flocks. Like the Southdown the "Shrop" matures at an early age, and this combined with easy-fattening qualities and a good wool clip explains the popularity of the breed. The Oxford Down satisfies the farmer as to the weight of the annual wool clip, which tends to coarseness and length of staple, and in the amount of mutton. The size of the individual Oxford recommends it to many for they are among the largest; they also rank deservedly high as feeders. They are prolific and have met with favor for crossing on common sheep. Another medium-wool breed almost as large as the Oxford is the Hampshire Down. It occupies a superior position on account of its ability to produce early lambs, and although not reputed to be exceptionally prolific the breed ranks high in this respect. In England they adapt themselves to grazing in small areas; they pasture closely with the whole flock often formed in a semi-circle. The Hampshire has been mentioned relative to the production of early lambs, but in this regard the Dorset Horn occupies an unchallenged position. Not only will they breed twice a year, but they often give birth to twins and sometimes triplets. The lambs grow rapidly and appear especially suited for the hot-house lamb trade. As a grazer the Cheviot demands the most attention of the English breeds, and the Suffolk Down is noted for fecundity. These two breeds are not largely patronized in Canada, but they have established themselves in the favor of many farmers. Of the long-wooled breeds the Leicester, the Cotswold and the Lincoln are supreme. They meet the desire of the farmer for size, and in this respect perhaps the Lincoln leads. These three breeds require abundant pasturage, but in return they yield heavy fleeces of long wool and good carcasses. As yet the Merino has not been mentioned, but for the finest quality of wool and for grazing propensities superior to those of any other breed we must go to the Merino. Their great stronghold is on the ranch where they herd in large numbers and endure many hardships.

SWINE

The hogs seen in Canada and the United States differ in one essential. To the South they breed and feed the lard or fat hog, while our market demands bacon and toward that end breeds are chosen. We do have the Chester White, however, as a representative of the lard breeds, but the Yorkshire, Berkshire and Tamworth hold sway in Canada with a herd of Hampshires, Duroc-Jerseys or Poland-Chinas, to be seen on occasional farms. In England, Ireland, Denmark and Canada, where bacon is produced, the Yorkshire or Yorkshire grade is perhaps the most common. It is considered a prolific breed, and will furnish a 200-pound hog at six months on fair feeding. The Tamworth was introduced into the Canadian industry on account of the quality of the bacon which it produces. In it there is no excessive fat; the sides are long and the admixture of the fat and lean meat is very acceptable. The fecundity of the Tamworth is also a striking feature and so is their ability to rustle. The Berkshire, in the eyes of Canadian breeders, is a compromise between the extreme lard and bacon



Perfect Health

For your run-down stock. Horses, cattle, sheep and hogs in poor condition are never profitable. No animal can work steadily, grow rapidly, produce heavily, bear vigorous young, unless able to eat heartily and thoroughly digest the food. The organs of digestion and circulation must be kept strong and active if profits are to be secured.

PRATTS Animal Regulator

is the unequalled stock tonic and conditioner. The only preparation that has a record of forty-four years' successful use by leading stock owners.

25c, 50, $1; 25-lb. Pail, $3.50.

Be prepared for accidents. Keep on hand for immediate use

PRATTS Healing Ointment and Healing Powder

25c, 50c.

good for man or beast; cures burns, scalds, cuts, sores, wounds, skin cracks. Pleasant to use, soothing, quick acting.

Sold by dealers everywhere or

Pratt Food Company of Canada Ltd.
68E CLAREMONT ST., - TORONTO.

Satisfaction guaranteed or money back.

NEW COAL OIL LIGHT

Beats Electric or Gasoline

MEN WITH RIGS OR AUTOS MAKE $300 A MONTH

10 DAYS FREE

Send No Money

We don't ask you to pay **a cent** until you have used this wonderful modern light in your own home ten days—we even pay transportation charges. You may return it at our expense if not perfectly satisfied after putting it to every possible test 10 nights. You can't lose a cent. We want to prove to you that it makes an ordinary oil lamp look like a candle; beats electric, gasoline or acetylene. Lights and is put out like old oil lamp. Tests by Government and 33 leading Universities show it

BURNS 70 Hours On ONE GALLON

common Coal Oil (kerosene), and gives more than twice as much light as the best round wick open flame lamps. No odor, smoke or noise; simple, clean, no pressure, won't explode. Several million people already enjoying this powerful, white steady light, nearest to sunlight. It's GUARANTEED.

Get FREE Book

Won Gold Medal

Aladdin
MANTLE LAMP

No Money Needed

We Furnish Capital

Without any sales experience, yes even without capital, you can make a big success by placing the Aladdin on trial. If you haven't capital we will help you with our liberal credit plan.

Every home wants and needs this wonderful light, that from half the usual amount of oil produces the brightest, mellowest light obtainable. To sell the Aladdin is a simple matter of getting the light into people's hands. After a trial nobody wants to go back to old feeble lighting methods. Hundreds of men are making $100 to $300 a month. Here are two letters just like thousands we receive:

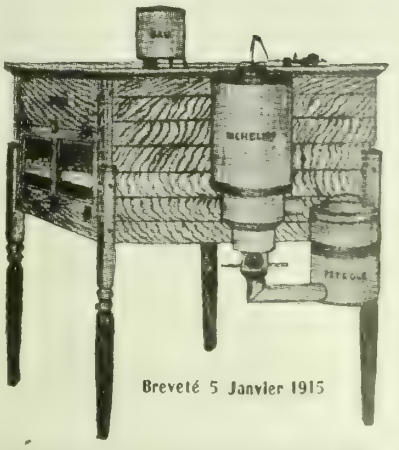
"Out of eight calls I sold six. Then ordered in four dozen lots and sold five lamps a day. My patrons all say they are fine after using them a year."—H. B. Stewart.

"Between Jan. 2 and Feb. 20, I sold about 275 lamps. I never saw anything that would sell equal to it."—Charlie Conrad.

Get One FREE We want **one user in each locality** to whom we can refer customers. Be the first and get our special introductory offer under which you get your own lamp **FREE** for showing it to a few neighbors and sending in their orders. Write quick for beautifully illustrated **FREE Book** and get full particulars. Address nearest office

Sample Sent Prepaid—10 Days FREE to responsible men. Tell us what territory you prefer, whether you have a rig or auto so you can work in country, how long you have lived in the community, etc., so we can give you full information, agency terms, credit plan and sample lamp for free trial.

MANTLE LAMP COMPANY, 1313 Aladdin Building
Largest Coal Oil Mantle Lamp House in the World
Montreal or Winnipeg



Breveté 5 Janvier 1915

" RICHELIEU "

Is the name of a self-going INCUBATOR—which hatches vigorous and healthy chicks—which is supplied with a self-filling lamp—in which a key turns all off the eggs smoothly and instantaneously.

GOLD MEDAL at the Quebec Exhibition.

"RICHELIEU" is also the name of a brooder which delights chickens and make breeders wealthy.

"RICHELIEU" is the marvelous OVOSCOPE which candles eggs without handling.

Ask for Catalogue.

Thermometers, drinking fountains, hoppers, leg bands, dressing and caponizing outfits, exhibition coops, etc.

Our shipping coops are nothing but jewels.

RICHELIEU INCUBATOR, Regt., St. Hyacinthe, Que.

types. They mature early, are good feeders, and when young the pork is found very acceptable on the market. Some stockmen have been successful in topping Yorkshire sows with Berkshire boars. The prolificacy of the dam is thus made use of while the pigs combine some of the good features of each breed.—*Farmer's Advocate.*

A STORY WITH A MORAL

AMONG the many fables Tolstoy wrote for the Russian peasant, embodying economic and moral truths, one of the best is that about the peasant who sold his soul to the Devil for land. This poor muzhik had never owned a foot of land. He thought that if he could only possess a certain field he had rented for years he would be the happiest man in the world. So he made a bargain with the Devil, and got that field. After a while he coveted the field next to it, and got that. Then he wanted another piece to round out his holdings, and got it. Then he wanted a farm, and then a country estate, and got both. But still he was not satisfied.

One day he heard that far over in the Tatar country a man might buy, for a little money, as much virgin land as he could run round between sunrise and sunset. So he sold out his estate and journeyed there. His bargain was quickly struck with the Tatar chief, and next morning the whole tribe gathered on a hilltop to see him start. He was stripped for running, and darted off in a straight line the moment the sun showed over the horizon. All day he ran and ran. He would come to a fertile valley, and say: "I must have that," and run round it, or hurry out of his course to take in a piece of fine woods or meadow land. He ran and ran. By sunset he had to speed desperately to beat the sinking sun, but succeeded in reaching the hilltop and the waiting tribe just as it disappeared, completing his course. And then he fell dead with exhaustion, and the Tatar chief chuckled mockingly — he was the Devil!

This fable should carry a moral to Canadian growers. We have a weakness in good times for adding to our land holdings. We take the money earned in a good year and buy ten or twenty acres on the north to round out the place. We borrow money to fence and plant it. Next year is a good year, too, and maybe we round out the south corner.

By and by a lean year comes along. It catches us owing money at the bank, or on mortgage, or with not enough capital to work our holdings. We are overextended, and that means worry, hardship and loss, even if the sheriff doesn't sell us out.

In farming, as in every other business, there is a certain limit to the size of plant a man can swing profitably. Size differs with men and means, but the limit is definite. If we want to make more money we stand better chances by increasing efficiency in the plant that fits us than by adding more plant. Happy is the grower who learns his proper limit and sticks to it. He is prosperous too.—Exchange.

THE MODERN RURAL SCHOOL

How nearly does your School measure up to this standard ?

SCHOOL EQUIPMENT

EVERY school room should be furnished with a suitable desk and at least two chairs in addition to the teacher's, a book case and a cupboard for supplies and apparatus. For the acommodation of the pupils a sufficient number of single desks should be provided, the desks being firmly fastened to the floors in rows with passages at least three feet wide between the outside rows and the walls of the school room. (The desks should, of course, be adjustable to the size of the scholar. Ed.).

Individual cups or a sanitary drinking fountain, also individual towels, must be provided.

The blackboard should be at least four feet wide and not more than two and one-half feet from the floor. There should be as least one hundred square feet of blackboard space.

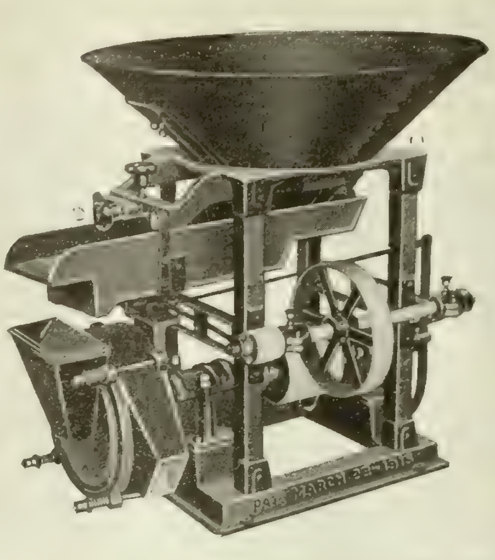
The following items of equipment are essential: a dictionary; a globe; maps of the world, North and South America, Canada, British Isles; a clock; thermometer; brushes; brooms; dust-pans; crayons; and such other articles as may be required for the proper care of the school. In addition, equipment is required for kindergarten and busy work, garden tools for school gardening and such special equipment as is required for household science. If instruction is given to pupils above grade VII a little simple physical and chemical apparatus would be necessary.

Note:—Much of this equipment for school gardening, household science, agriculture and elementary science may be obtained by the pupils or the teacher at very little expense.

SCHOOL GROUNDS

The school grounds should comprise an area of at least two acres to afford ample space for a school garden, experimental plots and play-grounds. They should be suitably fenced and protected on the north, east and west by a shelter belt. Ornamental beds of flowers and shrubs should be laid out so as to provide a beautiful and natural environment for the pupils. A school garden of at least one-half acre should be kept under cultivation, and should be divided into individual plots for the pupils and the experimental plot, which should be used by the teacher in connection with his work in nature study and agriculture. —*A. W. Cocks, Director of School Agriculture for Saskatchewan.*

Don't forget the ice supply for the coming summer. It is estimated that one and a half tons of ice per cow should be gathered for an average season.

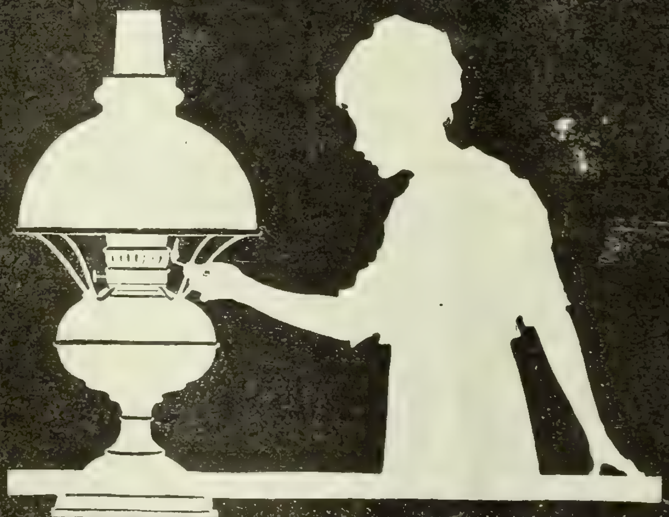


GRAIN GRINDING Problem
Now solved.
With the M-RÉ
Grain Grinder
With which you get as good Chop as with the old stone Grinder and at the same time Large production with small power.
Get our catalogue sent free on request.
Apply
THE PLESSISVILLE FOUNDRY,
Plessisville, Qué., Can.
General Agents, for
The M-RE Grinder Ltd.

VIGORA
Keeps the Horse Healthy
VIGORA strengthens the horse by cleansing the blood, thereby preventing various diseases. The best remedy for Coughs, Broken wind, Glanders, Worms, Skin diseases, etc.
PRICE 50c A BOTTLE.
ON SALE EVERYWHERE.
Get all information from
J. B. MORIN, Wholesale Druggist
QUEBEC, CANADA.

FOUND MONEY
SUBSCRIBERS WISHING TO TAKE UP SUBSCRIPTIONS FOR THE
JOURNAL OF AGRICULTURE
IN THEIR RESPECTIVE LOCALITIES ARE REQUESTED TO WRITE TO THE MANAGER FOR TERMS AND CONDITIONS.
J. B. LAPOINTE,
73 St. James, - Montreal.

EASY to LIGHT
SOFT and BRIGHT
Rayo
Lamps



ROYALITE OIL GIVES BEST RESULTS

A H

The JOURNAL of AGRICULTURE

AND HORTICULTURE

UNIVERSITY OF ILLINOIS LIBRARY
[illegible] 1916

Volume 19 — *March 1st 1916* — *Number 9*

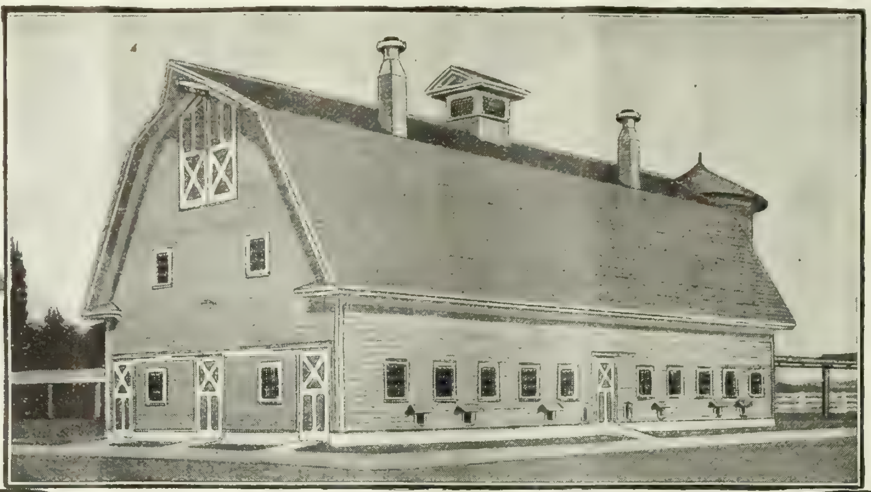
THE MAPLE SUGAR SCHOOL AT BEAUCEVILLE.

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

LOUDEN BARN EQUIPMENT

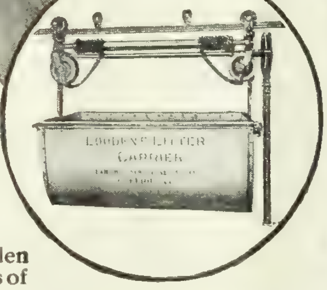
FOR QUALITY FOR SERVICE FOR SECURITY

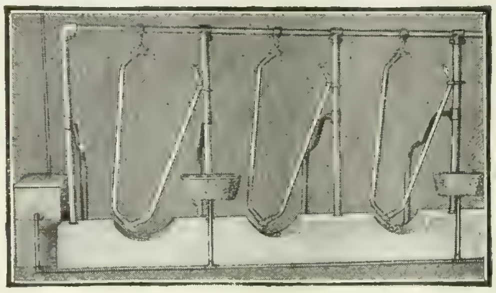
FILL OUT AND MAIL US THE COUPON FOR THIS FREE BOOK.

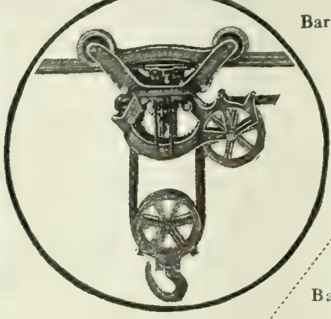


Book of Barn Plans Free

Louden "Barn Plans" is not a catalogue of barn equipment. It is a complete and valuable book of reference and instruction on barn construction. The 112 pages of Louden Barn plans is full of dollar saving information—the best of ideas gathered by the Louden Company during many years of barn building, and barn equipment experience. 51 representative designs for cow barns, horse barns, general purpose barns and hog houses. In addition, there are 32 pages devoted to general construction problems, such as concrete work, laying floors, roof construction, ventilation, etc.







LOUDEN MACHINERY CO.

145 CRIMEA ST., GUELPH, ONT.

VANCOUVER, B.C. WINNIPEG, MAN. ST. JOHN, N.B.

Louden equipment makes possible a clean, sanitary barn with a minimum of expense for upkeep. When cows are transferred from dark, dirty barns to Louden barns, the milk flow often increases from 15 to 25 per cent. and the labour of caring for the herd is reduced from one-third to one-half.

The cost of of installing Louden equipment is surprisingly small, and is just as great an economy for the man with a half dozen animals as for a man with a hundred. The percentage of labour saved is the same.

The Louden Line includes;

Litter Carriers, Hay Carriers,
Feed Carriers, Cow Stalls,
Horse Stalls, Water Basins,
Cow Pens, Bull Pens,
Hog Pens,
Barn Door Hangers.

Catalogues Free

Please send me copy of Louden Barn Plans, I expect to build (or remodel) barn for

....................cows

and............... horses.

Barn will be about

x ft.

Name......................................

P.O...

Prov...

OFFICIAL AWARD RIBBON
PANAMA-PACIFIC INTERNATIONAL EXPOSITION SAN FRANCISCO 1915
PRESIDENT
MEDAL OF HONOR
DEPARTMENT OF MANUFACTURES AND VARIED INDUSTRIES
CHIEF

Big Ben

—took first

prize in the alarm clock class at the San Francisco fair.

Big Ben was shown every day of the fair, almost ten months. He was judged on appearance, performance, pedigree. He carried off the Medal of Honor, the highest award on alarm clocks.

Big Ben is shown by all good dealers. Ask to have him put through his paces. In the United States $2.50. In Canada $3.00.

Western Clock Co.

La Salle, Illinois Makers of Westclox

"It is such a saving in labor I must have a power outfit."

In his sixth order to us, Mr. J. C. Harris of Ingersoll, Ont., says more for the Spramotor than our most enthusiastic advertisement. A man may buy a thing once and be dissatisfied, but when he comes back for additional purchases, there is only one conclusion that we can come to, and that is that article must be all right. We never claimed more for the

Spramotor

It isn't a SPRAMOTOR unless we made it

than that it would do the work required of it effectively and economically and in all things give satisfaction. And letters which we have received and are constantly receiving from farmers all over Canada, signify that our statements have been met with a service that is making staunch friends for the Spramotor wherever it is used. Over 100 Gold Medals and Special Awards to the credit of the Spramotor shows that these expressions of confidence are merited. Suppose you write now while the matter is fresh in your mind for a copy of our booklet on crop diseases.

Made in Canada — No duty to pay.

HEARD SPRAMOTOR LTD.,

2803 King Street, - - - - London, Canada.

Away With Dark, Dull, Cheerless Homes

Write for the "Sun" Light Book—FREE

It tells how to make home the "brightest spot on earth" at less than cost of gas, electricity, acetylene or kerosene.

"Sun" Semi-Indirect Gasoline Lamps

Last word in beautiful, cheery illumination. Styles for gas and electricity, also. Send for pictures, liberal terms to agents, premium offer, full information. Sun Light Co., 1620 Market St., Canton, O.

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

Volume 19

The JOURNAL of AGRICULTURE
AND HORTICULTURE

MARCH 1st 1916

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 93,634
ENGLISH, 9,820
FRENCH, 83,814

Number 9

EDITORIAL

PROSPECTS FOR 1916

CANADIAN farmers rallied their forces in 1915 and with the aid of a kind Providence produced the largest crop in the history of the country. The importance of this great crop yield at the present juncture of affairs can hardly be over-estimated. It enables Canada to finance her share of the cost of a large expeditionary force, and to supply the Mother country with provisions. All this is very creditable to Canadians, but what about 1916? Conditions have altered to a considerable extent since last autumn when the 1915 harvest was garnered. The continuous demand for fighters is depleting the ranks of farm workers, and there is a danger that the depletion will be carried too far. Crops cannot be grown without suitable preparation of the soil and considerable manual labour. We fear that many farms will be left shorthanded, with the result that fewer acres will be sown to crops.

Fortunately last autumn remained open longer than usual and more fall plowing was done than usual, but the pinch will come when seed-time arrives. Usually the spring season comes upon us quickly and, even under favorable weather conditions, seed-time is short. When the working force is limited to one man, or to a man and a boy, as is the case on many farms, the work that is possible to be done is limited. We fear, therefore, that the acreage for 1916 will be smaller than that of 1915.

There is also a possibility that the coming season may not be so favorable for crop production as last. Should this occur, then Canada stands to lose a large amount, and her credit and her ability to help the Mother countries would be greatly weakened. We are not pessimists or prophets of blue ruin; on the contrary we believe that Canada is both willing and able to stand a tremendous strain. The point, however, we emphasize is the undesirability from a national standpoint of weakening or putting restraints upon our greatest asset.

We are pleased to note the renewal of activity in live-stock circles. The breeders are determined to increase the supply of live stock for export. It may be possible by such means to make up the probable deficiency in grain production.

We can depend upon the farmers to do their share, which is a most important one, in meeting the serious situation which confronts Canada at the present time.

PROSPECTS OF THE MAPLE INDUSTRY

THE outlook for the maple syrup and sugar market was never brighter than this year. Last season's harvest was so small that the stock has been completely cleared out. High prices have prevailed and are practically certain to continue this year, however great the production. The United States duty on syrup and sugar is to come off on May 1st, thus opening to our makers the greatest market in the world for their products. The demand from England and France during the past year has been considerable. Doubtless the advertising campaign carried on under the auspices of the Hon. Mr. Caron and the gifts of our makers to the Canadian Red Cross Hospitals have had the effect of awakening an interest in maple goods in the mother countries of our people..

The Inland Revenue Department has been diligent in putting into force the amendments to the Adulteration Act prohibiting the manufacture of imitation and compound goods. Some of the great firms engaged in adulterating have gone to the wall. Others have apparently abandoned the practice of adulterating. New methods of detecting adulteration are being developed. The possibilities of utilizing sugar sand are being investigated. A large French chemical manufacturing house took a quantity of sugar sand for this purpose last year and would have taken four times as much as was saved by our farmers.

Altogether the prospect is most encouraging and the farmer can make his preparations for sugaring with every confidence of a good trade.

WARBLE FLIES ON CATTLE

FOR the last four or five years cattle in pasture in the Chateauguay and Huntingdon districts have been tormented in June and July by large flies known as the Ox-warble Fly. These flies have become such a nuisance that many of the farmers are anxious to know how to control them. The flies cause panic among cattle, making them race frantically across the fields. Some persons are under the impression that they sting the cattle, but such is not the case. Their persistent worrying causes the cattle to lose their nerve and become frantic. A warble fly resembles a wasp or bee, but it has a curious habit of attempting to alight on the cattle even after having been dislodged many times. For many years it was the opinion of scientific men that the eggs of warble flies were laid on the hairs of the front legs and flanks of the cattle, and were licked into the mouth, where they hatched; the maggots then bored through the lining of the gullet up through the muscles of the back to the surface, where they at last formed lumps or warbles.

This belief has been exploded by Dr. Hadwen of British Columbia, who has shown conclusively by many experiments that the eggs are laid on the flanks, hind legs, and other parts of the cow, and the maggots bore into the skin and make their way finally to the surface of the back where the warbles are formed. It is quite possible to control warble flies by concerted action on the part of all owners of stock, and we would heartily recommend this action to the farmers of the Chateauguay and Huntingdon districts. The flies are in the grub stage while in the warbles on the back, and if these grubs are destroyed there will be no flies to bother the cattle during the summer. The removal of the grubs from the warbles may be done most conveniently in March while the cattle are still in the stables. It would not take much time or trouble to insert a probe into the warble and to remove the enclosed grub.

If action is not taken soon the flies will spread to other districts and become a general menace to stock.

Scientists tell us that there are two species of warble flies, only one of which was known in this country until recently, and this one did not cause cattle to stampede. The second species has been introduced in recent years, probably through importations of cattle from the old countries, and is the one which causes worry to the cattle. This is the reason why cattle owners express surprise at the presence of this fly during the last few years.

NUMBER TWO APPLES

AT the meeting of the Quebec Pomological Society held at Macdonald College in December last considerable discussion took place regarding the grading of windfall apples. Several fruit-growers claimed that good wind-falls should be graded higher than No. 3, as they were in every way as valuable as No. 2 apples and in many cases much better. A large percentage was shown to be No. 1 but slightly bruised. It was suggested that a separate classification might be made of windfalls.

At the recent meeting of the Ontario Fruit growers Association in Toronto, the No. 2 apple was thoroughly discussed, and a committee brought in a Report recommending the establishment of two grades of No. 2 as follows: "A Quality" grade which must not include any culls, and be sound, of not less than nearly medium size and of a fair color for the variety, and not less than 85 percent free from scab, worm-holes, bruises and other defects, and properly packed."

"A Domestic" grade which must include no culls, be sound, of not less than nearly medium size and fair color for the variety, 90 percent free from worm holes, but may be slightly affected by scab and other minor defects, and properly packed". This recommendation was approved by the Association and was transmitted to the Dominion Fruit Commissioner.

Much will depend on the interpretation put upon the clause "other minor defects" by the officials of the Fruit Branch. Will this clause be taken to include hail marks, insect marks and bruises (windfalls)?

Such varieties as McIntosh and Fameuse, largely grown in Quebec, occasionally fall badly during

CONTENTS

EDITORIAL.—Prospects for 1916. — Prospects of the Maple Industry.—Warble Flies on Cattle.—Number Two Apples. — Developing the Boy and the Girl. — An Ideal Rural School in Scotland.

ORCHARD AND GARDEN.—Four Maple Sugar Schools.—Maple Sweets for the Soldiers.—Apple Cankers.—Sweet Pea Culture.

FARM AND FARM CROPS.—Spring Cultivation.—Seed Fair of the Huntingdon Agricultural Society, Div. A. — Bacteria in Frozen Soils.—Wild Morning Glory or Bindweed.—Lime and Soil.

LIVE STOCK. — Quebec Holstein Breeders meet.—Development of the Dairy Herd.—Some Flocks, Herds and Farms of the Bedford District.—Canadian Ayrshire Breeders' Association, Annual Meeting.—Canadian Ayrshire Breeders' Association, Report of the Secretary.—Some Cow Testing Possibilities.—The Feeding of Bacon Pigs.—Annual Meetings of the Local Wool Growers' and Sheep Breeders' Associations.

DAIRY. — Classification of Agricultural Products in the Province of Quebec.—Milk, the Problem and its Solution (Continued).—New Possibilities in Dairying, II.—Co-operative Agricultural Society of Cheesemakers of Quebec.

POULTRY.—The Hatching of Chicks.—Eggs to the Front.—The Exportation of Eggs and Poultry and the Requirements of the British Market after the War.—Twenty Lessons on Poultry.

WOMAN'S WORLD.—Foods and Food Preparation.

GENERAL INTEREST. — The Children's Homer. — Ulysses. — Light and Colour. — Outstanding Achievements in Agriculture.—Powdery Scab of Potatoes.—The Education that fits for Life.—The Agricultural Conquest of the Atmosphere.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

BUMPTIOUS PRINCE.—Prince Herbert Bismarck at a royal reception bumped roughly against an Italian prelate, who looked at him indignantly.

"You evidently don't know who I am", said the prince, haughtily. "I am Herbert Bismarck".

"Oh", answered the prelate, "if that doesn't amount to an apology, it is certainly a perfect explanation."—*Christian Register.*

a high wind storm in such a season as 1915, and although many of these fallen apples may be high class No. 1's in every respect except that they are slightly bruised, they are required under present conditions to be put in the No. 3 grade and consequently bring very little more than a No. 3 price. This is considered a hardship by the Quebec growers, and any change made in the workings of the Inspection and Sales Act should favor windfall apples, a factor in a season like 1915 beyond the control of the grower. The Quebec point of view should be presented to the commissioner before any definite change is made in the Act.

DEVELOPING THE BOY AND THE GIRL

Of the activities encouraged and promoted by funds provided under The Agricultural Instruction Act of the Dominion none is more worthy than the improved means which have been made possible for the development of the juvenile mind. There is but one way that the boys and girls can be rivetted to the soil and that is by strengthening their attachment for it. This can only be accomplished by the inculcation of knowledge presented not altogether in utility fashion but in a manner that will emphasize the brightness, the wonder and the attractiveness of the works of nature. This the boys' and girls' clubs are doing; this the school fairs are doing. This the nature study classes in the public schools are doing; this the school gardens are doing. They encourage association and sociability in the first instance, a desire for emulation in the second, a favourable disposition for the outdoor life in the third and an appreciation not only of the marvels, but also of the beauties, of creation in the fourth. All four divisions of the work receive substantial support in every province from the grants derived under the Agricultural Instruction Act. In Prince Edward Island, the sum devoted to these purposes in 1913-14, the first year the Act was in operation, was $5,529; in third year, or in 1915-16, it is $10,050. In Nova Scotia the sum thus employed under the Act in 1913-14 was $6,700; in 1915-16 it is $10,000. In New Brunswick in the first year it was $1,500. In the third year it is $10,000. In Quebec the first year it was $3,000; in the third it is $8,000. In Ontario it was $10,000, it is now $20,000. In Manitoba it was $2,000, it is this year $5,200. In Saskatchewan it is $2,100. In British Columbia $1,000 was so used in 1913-14, but this year for boys' and girls' competitions, fairs, etc., and instruction in public schools, $17,000 is to be spent from the grants. It must be understood that while in some of the provinces the money is directly employed for the purposes set forth, in others it is used in other ways and the sums required for school fairs, school gardens, and so on, are received from provincial and municipal sources. The figures, however, are in themselves abundant indication of the far-reaching benefits conferred by the Act.

AN IDEAL RURAL SCHOOL IN SCOTLAND

If a Quebec farmer were told that a rural school would improve his farming and dairying, he would smile at the idea. If he were told that a rural school could enable him to receive 8c a pound more for his butter, he would laugh at that idea in scorn. If he were told that in spite of taking ten hours a week for practical work in dairying and cooking, a rural school teacher could teach these subjects and all the others in addition, even better than they were taught before, he would think that a miracle had happened. Yet this miracle did happen in the small village of Ednam in Roxburghshire, Scotland, close to the Border, and in view of the attention which is at present being centered upon the problem of rural education, it will be of interest to the farmers to hear some account of this most interesting and suggestive experiment in a village school.

The population of the village is about five hundred souls, its extent 3,849 acres, its assessable value about $35,000. It is entirely agricultural. The farms are mainly arable and the soil is good. As wages are comparatively high on the land, the great majority of boys stay upon the land, but apart from that there is nothing to distinguish this village from any other village in an English-speaking community—nothing except the school, but the school is altogether extraordinary and exceptional.

There are 87 children on the roll, though the attendance varies greatly from year to year because farm laborers move at the hiring time.

The school is a two-room building, the Principal being a married teacher, whose wife gives him some help; and the assistant is a trained mistress. The headmaster has 46 children ten years old and upwards in one room and the mistress 41 children, from four to nine years of age, in the other room. But the most important teacher of all is the headmaster's wife, who, though an uncertificated teacher, has first class diplomas from training colleges and dairy institutes for cookery, laundry and dairy work. In the mornings she helps with the more backward children in the upper grades. In the afternoons she is entirely occupied in teaching practical subjects.

How this is Managed

The course of study in Scotland allows greater freedom for the teacher than our Quebec course. There is room for greater initiative in the way of subjects and textbooks, and grants are paid by the Department of Education in accordance with the work accomplished and according to the age of the child.

Another feature is that practical subjects are encouraged and, indeed, in public schools for pupils over twelve years of age, a supplementary course is provided.

Such children over 12, who have attended for six months and know their work, may get any subject such as Manual Training, Cookery, Laundry, Dressmaking, Horticulture, Dairying, Commercial Subjects, Navigation, and so on. It all depends upon the community and the subjects that are likely to be of greatest practical value to boys and girls brought up in that community. The encouragement in this work is very great. Instead of an ordinary grant of $5.50 per pupil, $12.50 are given for pupils taking this practical work and, in addition, $2.00 is paid for each hundred hours of such instruction. These grants are distinctly worth earning and have given great encouragement to the development of such work, especially as they are free from Red Tape and official paralysis.

Some years ago, no such practical subjects were taught at Ednam, but the Board at last appointed two teachers, a Mr. and Mrs. McDonald, from a highland school in Argyleshire, and Mr. McDonald immediately made use of his wife's qualifications for his elementary school and asked his School Board to allow practical work, such as cookery, laundry work, dressmaking, gardening, woodwork, and dairying. Being Scotch, they agreed provided the cost of the school was not increased, but they felt so interested that they built a little brick room, 15 x 14 ft., at a cost of $400, as an extension to the schoolroom. This was fitted with a range, a sink, cupboard and shelves, and a table, with space for 12 cookery pupils and in this single room, with the support and encouragement of the Department and the Inspector, cooking and dairying are taught to both boys and girls, and, in addition, wood-carving to boys, who also are taught some carpentry at the village joiners' shop. All children over 12 spend two hours every afternoon at this wtih no expense to the Board, who, indeed, make a profit by it owing to the special grants which bring $415, whereas the salary of Mrs. McDonald is only $325.

Cooking and Dairying

The material for cooking is found by Mrs. McDonald, who also uses or disposes of the cooked dishes. Accounts, which are carefully kept, show there is no financial loss. In one year she taught the cooking of 40 dinners suitable for a working class home, each dinner costing from 16 to 20c for three or four persons. Thus the children, who keep a careful record, work out the cost, and do their own marketing, at the end of the year have recipes and prices for 40 dinners and, what is more, boys get the same experience and make capable cooks.

The dairying is even better, if this is possible. Local butter in Ednam could only be sold for 8c a pound less than Danish butter and this seemed ridiculous to these enterprising and enthusiastic teachers. In spite of this village being entirely agricultural, the stores sold imported butter and also at a higher price than could be obtained for local butter, so the teachers set to work to introduce dairying into the curriculum. A cow was given by a generous admirer and when the experiment became a decided success, he also presented a separator. A farmer in the village keeps the cow for $50 a year. The School Board receive the products, which more than repay them, the milking being done by a servant, the churning and butter-making being done in the cookery room. The influence of this instruction was soon felt at home, because butter made by the children could easily command the same price as imported Danish butter. Neighbouring farmers soon recognised the superiority of school methods and were anxious to send to the school in summer as much cream as the children could make into butter for them. Churning is even done twice a day in summer.

One year six of these children were taken by their teacher to the Edinburgh Poultry and Dairy Exhibition and were entered for the butter-making competition. This competition was open to all comers and, indeed, professional dairy maids were the majority of the competitors. To everybody's amazement, the first four places were won by four of these children—three girls and a boy — who carried back to their school a silver cup in triumph. Even the College of Agriculture has recognised this direction of work and consented to examine the children in their course for the butter-making diploma. The children will have to take the regular theoretical and practical examinations and obtain the prescribed number of marks in the same way as regular college students. Surely this is a proof that good school work can sometimes equal good college work. More good will be done to boys and girls in school than to men and women of 20 and 30 in adult classes. The children learn easily and apply readily and there is no doubt that soon there will be no sale for Danish butter anywhere in the markets of the Border towns.

The Effect of Practical Subjects on the Rest of the Course of Study

Of course, the first question that one asks is how much time is given to such practical work. When we are told that ten hours a week are given, one realizes that actually one third of the time is devoted to subjects outside the usual curriculum. What, therefore, is done with the regular course of study, when only two-thirds of the regular time can be devoted to it? Strange to say the practical work resulted in added interest, thoroughness, and attention to the regular subjects. The school continues until four o'clock, thus the day is divided into two sessions of three hours each and the work reaches a level attained by very few of the best country schools. Even the drawing and art work from actual objects are of unusual excellence. All the teaching was full of life and vigor. The reality of the experience and the relation to their environment was very clear at every point. Every week the leading articles in the local papers are read aloud by one pupil and discussed by the rest. But the best test of the work is applied by the Department and its Inspector. No promotions are made to the supplementary class for children over 12 years of age unless the pupil is thoroughly proficient in his ordinary work. Schools which enter ten percent of their total roll for this supplementary work receive the mark "excellent" in the report because this proves that a large number of the children remain during the last two years of school and that they are practically all fit for this special work, but at Ednam, although ten hours were spent on other subjects, actually 15% passed in one year. This shows that when children are getting something valuable out of their school course, both they and their parents appreciate the fact and the children are anxious to stay longer at school and they do better work while at school.

Some Lessons to be Learned

The complaints about primary education everywhere merely show disappointment with its results. Army statistics for recruits show 69% no further advanced than fourth year school work and 11% almost illiterate. Employers of labor in the cities complain that their young employees cannot write, spell and count properly. Farmers in the country complain that their children are educated for the city and not for the country. The problem, therefore, must be faced as a whole. It is not only the rural school that is disappointing, but the whole system in town and country alike. The young are not enabled to develop their talents and fit themselves for life in their own community. The school does not make full use of every child's experience and environment. Insufficient allowance is made for practical work in the workshop, the garden, the kitchen, and the dairy, according to circumstances. Teachers do not receive enough credit for initiative, but are repressed within the limits of one textbook for each subject and one course of study.

Compulsory evening classes would not solve the problem, because, although the pupils might be enthusiastic, they are becoming too old to be moulded as they desire and, indeed, a rural evening school is an impossibility. Such a school as that at Ednam should cease to be an exception and become the rule, but how can this take place?

I. *More Practical Curriculum Needed*

Subjects should be introduced which are both real and valuable for the child. Subjects should be introduced that are suitable for each locality, whether it be city or country. 70% of all children will earn their livelihood in future through the use of their hands. Actual manual work of various kinds should, therefore, be taught early. The needs of the community must always be taken into consideration.

In Scotland, in towns on the sea coast, there are many schools which teach cooking and elementary navigation to boys simply because fishing is the general local industry.

In many parts of the United States, especially in California, practical work is srongly insisted upon. Many normal colleges for the training of teachers actually execute all the printing on the premises.

In the rural schools in the Philippine Islands, the United States school authorities teach vegetable growing, straw weaving, hat making and carpentry, and are thus not merely making children useful members of society, but are even raising the level of civilization throughout the islands.

In Alaska the Esquimaux are taught gardening, care of the reindeer, carpentry, house building, sanitation, and elementary medicine, because these subjects are vital in Alaska.

It is indeed strange that the best schools from this point of view under the authority of the United States are found in localities where there is no self government or no democracy. It has sometimes been suggested that a paternal government would improve education in a generation more effectively than can be done by School Boards in centuries. There is a great deal of truth in this, because a Government provides proper accommodation, sees that there are the necessary supplies, provides trained teachers and, lastly, and most important, defrays the cost.

The following is the Time Table for the afternoon at Ednam:—

Monday — Dairying, boys and girls.
Tuesday — Gardening, boys. Laundry, girls.
Wednesday — Cookery, boys and girls.
Thursday — Dairying, boys and girls.
Friday — Woodwork, boys. Gardening, girls.

N.B.—Laundry and Housewifery are taken on alternate Tuesdays.

II. *Difficulties in the Path*

(1) *Accommodation*

The obstacles are, of course, those mentioned in the last paragraph and the problem ultimately becomes one of dollars and cents. In the case of accommodation, there should be little difficulty. If the work were done first the School Board would soon see the value of it and would then take steps to look after the buildings. If the results are good, the buildings will come later.

This also has happened at Ednam, where, because of the enthusiasm produced by the admirable work, a model school is being built although the old buildings have not been condemned. The occasional use of other premises for cooking and other subjects has been tried successfully in many a country village, but if the work is taken care of, the buildings will take care of themselves.

(2) *Cost*

There is no doubt that our educational grants are inadequate. In fact, they are very inadequate. Special encouragement should be given to School Boards for doing such practical work in addition to the poor municipality grant and the minimum salary grant. The principle is the same. Because certain things cannot be done locally, but are desirable, the Government helps the locality by means of grants. In Scotland the Government contributes almost 73% of the cost in such cases, although as a rule only two thirds is paid for out of Government grants, leaving only one third to be met by local taxes. Here in Quebec however, the school taxes are a heavy burden because they are paid directly. Government grants, of course, have to be paid out of taxes likewise, but as these taxes are indirect, their incidence is not felt and therefore they are not objectionable. Besides, there is greater fairness when larger communities contribute towards general expenses and this is the case with Government grants.

III. *Trained Teachers are Necessary*

Perhaps even teachers with Domestic Science training will be necessary. Some day, in communities of any size, the School Boards will provide teachers' houses as well as school buildings, — with the addition, in some cases, of a small farm to keep the teacher engaged in summer. In other cases men will be employed rather than women and other public duties will be assigned to them to enable them to make a decent living in the country. The teachers' garden would then be an excellent workshop for the boys.

In France this actually is universally the case. The rural teacher is secretary of the Mayor of the locality and also registrar and, in his own garden, he can teach the boys to prune, graft, and care for the grape vines and fruit trees. He is a useful man in the community and even acts as an unofficial lawyer and advisor.

The untrained teacher may get a smaller salary, but she is not cheap. She is dear at any money and does more damage than good. If salaries were sufficiently attractive, there would soon be no difficulty in securing a proper teacher, but we ought to have fewer primary schools in each pality with an enrolment of nine pupils. In Quebec, more than elsewhere, we must consolidate the schools and get better staff and equipment.

The solution, therefore, lies in greater Government control with consequent larger Government grants and greater encouragement on the part of trustees and commissioners.

It may even be found that if women are given the right to vote for School Boards, many of these present day criticisms will be removed.

SINCLAIR LAIRD

CRASS CARELESSNESS.—The holiday traffic was at its height, and there were the usual piles of passengers' luggage on the platform of a great London terminus. In the usual way, the porters were banging it about, while the owners mournfully looked on.

THE GARDEN AND ORCHARD

FOUR MAPLE SUGAR SCHOOLS

FOUR maple sugar making schools will be operated this year under the auspices of the Hon. J. Edward Caron, Minister of Agriculture. The situation and capacities of the schools are as follows:—

COUNTY.	POST OFFICE.	DIRECTOR.	STUDENT CAPACITY.
Beauce,	Beauceville,	Mr. A. Bolduc,	6
L'Islet,	Ste. Louise,	Mr. L.J.C. Dupuis,	10
Labelle,	La Minerve,	Mr. J. H. Lefebvre,	10
Portneuf,	St. Casimir,	Mr. J A. Tessier,	8.

Our cover illustration shows the Beauceville School which, established in 1914, has already been visited by over 500 sugar makers. The director of the Ste. Louise school has for many years been engaged in demonstrating for the Provincial Government, while the La Minerve school is conducted by the Secretary-Treasurer of the Pure Maple Syrup and Sugar Co-operative Agricultural Association, Mr. Joseph H. Lefebvre of Waterloo.

As the number of students that can be accommodated in each school is limited, young men desiring to take a course this year should lose no time in sending in their names and addresses to the Hon. Minister of Agriculture, Quebec.

MAPLE SWEETS FOR THE SOLDIERS

LAST year the Canadian Red Cross Society sent over the ocean some three and a half tons of maple sugar and one thousand gallons of maple syrup, donated by the makers to the Canadian Red Cross hospitals in England and France. How much this peculiarly Canadian product appealed to our wounded men is indicated by the following letters:—

London, January 6th 1916.

Mr. John H. Grimm,

MONTREAL.

Dear Mr. Grimm,

As you have been so interested in the collection and shipment of maple syrup and sugar which has eventually reached Canadian soldiers abroad through the C.R.C. Society, we feel sure you will be glad to hear that maple syrup and maple sugar have been very greatly appreciated by the recipients thereof. If, therefore, you think of continuing your good work during the coming spring we wish you to know that it is very well worth while and that we appreciate very greatly your kind co-operation in this important matter.

Claude E. Bryan, Capt.,
Asst. Commissioner,
Canadian Red Cross.

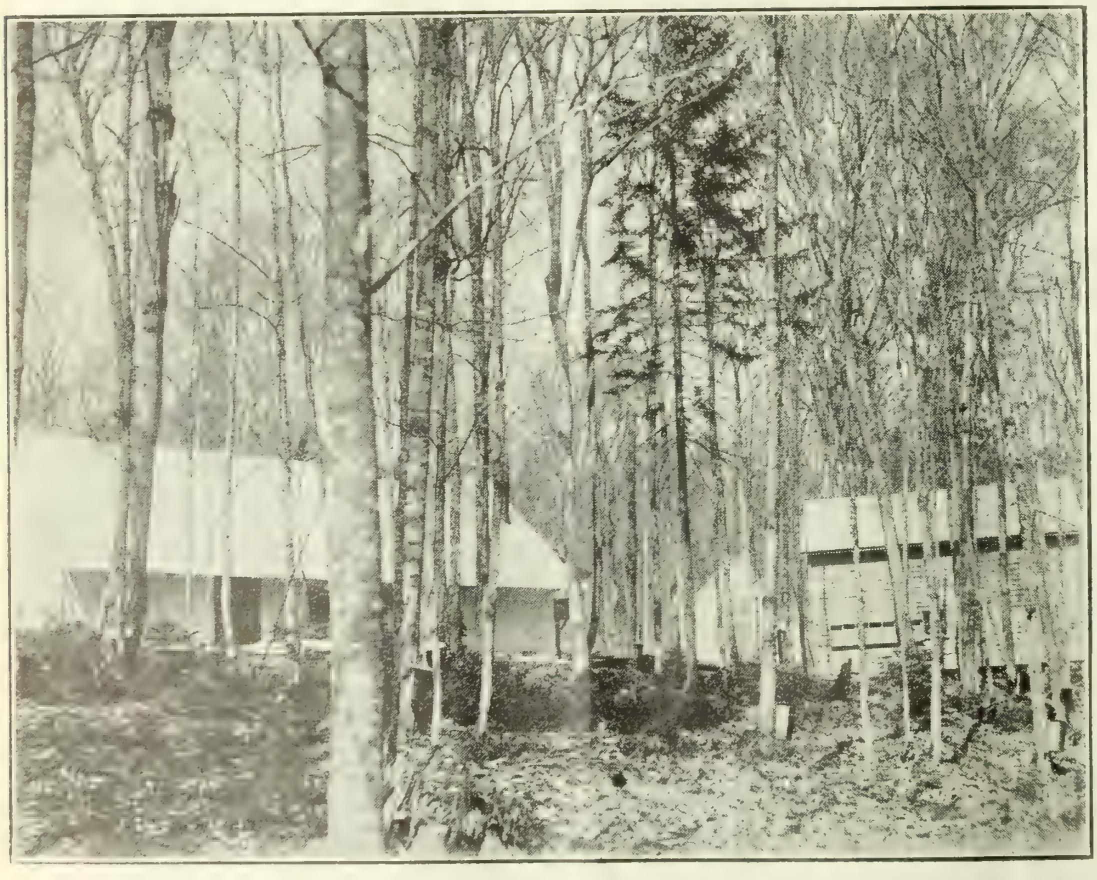
Red Cross, Taplow, Bucks,
Jan., 5th 1916.

Dear Col. Hodgetts,

During last spring we received a large consignment of maple sugar and maple syrup from Mr. Grimm of the Grimm Mnfg. Co., Montreal, P. Q. I cannot tell you how much the patients appreciate this maple syrup. They love it and look for it. We have not any in stock at present, and wish we had it by the barrel, as it is one of the best articles sent to us from Canada, and I assure you we cannot receive too much of it.

Charles W. F. Gorrell, Lieut. Col.,
In charge Hospital,
Taplow, Bucks.

It is the intention of the Canadian Red Cross to forward similar contributions this year and we hope this appeal for donations will meet with the same generous response at least year. The Canadian farmer who has a sugar bush is fortunate in being able to contribute so materially to the welfare and happiness of our wounded boys.



General View of the Beauceville Maple Sugar School. In its two seasons of operation this school has had over 500 visitors.

APPLE CANKERS

APPLE cankers form dead spots on the twigs and branches of apple trees, and occasionally extend down onto the bodies. There are several different types of apple cankers in various parts of the United States. Occasionally two or more kinds may occur on the same tree. They are caused by fungi growing comparatively slowly in the bark and killing it. They often enter in the twigs, fruit spurs, or blighted areas, killed by pear blight, but may infect entirely independent of these sources. Frequently locust scars and pruning wounds, or other injuries, furnish the point of entry, but some kinds of cankers infect directly into the bark.

Where the canker is located on a branch or limb which can readily be spared, and especially if it reaches half or nearly half way around the limb, it is best to saw off the limb, cutting six inches to a foot below the lowest evidence of disease, then disinfect and paint or apply the coal tar creosote oil wound paint. Cankers located on a large branch which can not readily be spared, or on the body of the tree, may be eradicated and trimmed out using the coal tar creosote oil wound treatment immediately on finishing the scar.

Cankers do not require the prompt re-inspection and re-trimming as in virulent pear blight cases, but it is a good practice to look them over the following spring and again in the fall, and re-work them or saw off the branch if an occasional failure has resulted. Some cankers behave rather differently from pear blight, in that they check up during the growing period of spring and summer, and the tree attempts to heal them over; then in the fall and winter the canker spreads again, killing the margin of new growth. This is frequently repeated several times as the canker enlarges. Such old cases are rather mean to work on, and usually, though not always, demand the removal of the branch.

In very bad outbreaks of apple canker, fall spraying with rather thick Bordeaux mixture, at least as strong as 5-5-50, is advisable. This treatment is not usually necessary in most apple districts, but if the grower is having a real fight against apple cankers, the fall eradication should be made rather promptly, as soon as the leaves are off, and the whole orchard should be sprayed with this mixture. This protects the tree against most of the re-infections in the bark, and probably kills the spores on the surface of the wood, and possibly many minor or incipient cankers.

SWEET PEA CULTURE

SWEET Peas are one of the most popular garden annuals, and the more the flowers are cut from the vines the longer will the plants continue to bloom; in fact by not allowing any seed pods to set, and with good cultivation, sweet peas will bloom for several weeks. Any ordinary soil will grow them, but it should be of such a nature that the water will not lie and so cause the roots to rot.

Planting

The trench should be prepared by digging two spades deep; should the subsoil be poor, do not bring it to the surface but turn it over, break it up and mix with it old garden refuse or stable litter. With the top layer there should be mixed a liberal quantity of cow manure, or decayed stable manure, the former for choice, adding a good dressing of bone meal. Better results are obtained by preparing the trench in the fall, as this will give the fertilizers a better chance to cooperate with the soil.

As soon as the frost is out of the ground in early spring and the soil is in a fairly good condition, the seeds should be sown; whether the ground has been prepared as stated above or dug one spade deep the method of procedure is the same. A small trench of about 4 inches deep should be dug and the seed sown evenly about two inches apart, covering with about two inches of soil. Make the surface soil firm, then scatter a little soot along the row to keep away the birds and insects. The seeds should be planted right in the open where the plants can benefit by the light and no excessive shade will interfere with the growth of the vines. When the seedlings are about two inches high thin them out to about six inches apart to allow the air and light to circulate freely amongst the vines. The natural results of this are larger flowers, longer stems, better colours, and more prolific blooming. As the young vines grow the soil should be hoed up to them on both sides in order to strengthen the plants and keep them in an upright position.

Staking

A great diversity of opinion prevails as to the best method of staking sweet pea vines. I strongly recommend the use of birch twigs cut in lengths of 5 or 6 feet before the leaves appear; these should be inserted in the soil at least 9 inches with the tops inclining a little outwards. Should they not be sufficiently branched at the base, a few short twigs may be inserted between the taller ones. If it is impossible to procure suitable twigs the best substitute is wire netting of 4" or 6" mesh. The initial cost of this is a drawback, but it is perhaps the cheapest in the long run, lasting as it does for several years. Netting 4 to 6 feet wide will be found sufficient. Stakes will have to be used to support the netting, driven 12 or 18 inches into the ground at intervals of 6 feet. Some people recommend double rows 12 inches apart, but in my opinion single rows are better.

Another method is the use of twine. In this case stout stakes are used, driving one into the ground every 5 feet, then running the twine from stake to stake commencing a few inches from the ground and leaving a space of 6 inches between each length. This is economical, but not so satisfactory as twigs or wire netting.

Watering

The liberal use of the hoe will be of great service in conserving the moisture and at the same time will keep down the weeds.

Should the weather be very dry a liberal mulch of manure extending about one foot on either side of the vines and watered two or three times a week will keep the plants growing.

No liquid manure should be applied until the first blossoms appear, and then only sparingly and in a week solution. As the plants come into full flower the liquid manure may be given stronger.

Sweet Peas for Exhibition

To grow sweet peas for exhibition will entail quite a lot of extra work. The preparation of the trench is the same, but the plants should be at least one foot apart. All the laterals should be taken out but two or three, thus allowing those that are left to grow more vigorously. As soon as the buds appear feeding should be commenced, using a weak liquid manure. Place about 1 peck of soot in a bag and let it dissolve in a tub filled with water, then apply to the vines once a week. Guano may be used in the proportion of 1 lb. to 20 gallons of water, or sulphate of potash 1 ounce to 1 gallon of water.

Flowers that are to be exhibited should be covered with cheese cloth three days before the exhibition takes place. Late in the season nitrate of soda is a wonderful pick-me-up, used in a proportion of 1 tablespoonful to a gallon of water.

Spencer Varieties

The following are the names of twelve good varieties of Spencer sweet peas:—

Flora Norton Spencer . .	Blue.
Jabin Ingman	Carmine.
Charles Foster	Fancy.
R. T. Felton	Lavender.
Nubian	Maroon.
Thomas Stevenson . . .	Orange scarlet.
Mrs. C. W. Breadmore. .	Picotee edged.
Ufrida Pearson	Cream ground.
Hercules	Pale Pink.
	Deep Pink.
Barbara	Salmon.
Mrs. W. J. Unwin . . .	Striped.
King White	White.

Some of the mixed selections sold by seedsmen are also very good.

E. H. JONES

Some good varieties of Spencer Sweet Peas.

POTATO SPRAYING EXPERIMENTS CONDUCTED DURING THE SUMMER OF 1915

SEVERAL experiments to determine the benifit derived from spraying potatoes with Bordeaux Mixture to prevent Late Blight and Rot were carried on by the writer, with the assistance of the Farmer on whose place the experiments were conducted.

The results are given below.

On Farm of Mr. Geo. Harvey, Danville, Que.,

Yield per acre

Sprayed	254 Bus. at 40c a Bu.	$101.60
Unsprayed. . .	214 Bus. at 40c a Bu.	85.60
Returns per acre from spraying . .		$16.00

On Farm of R. G. Dunbar, Melbourne Ridge, Que.,

Yield per acre

Sprayed	245 Bus. at 40c a Bu.	$98.00
Unsprayed. . .	170 Bus. at 40c a Bu.	68.00
Returns per acre from spraying . .		$24.80

On Farm of Geo. Burbank, Danville, Que.,

Yield per acre

Sprayed	323 Bus. at 40c a Bu.	$129.20
Unsprayed . . .	261 Bus. at 40c a Bu.	104.40
Returns per acre from spraying . .		$24.80

The cost of spraying one acre of potatoes three times, totaled $10.00, made up as follaws:—

Labor—	
2 men . . . . 6 Hrs. @ .30c an hour.	$1.80
Horse . . . . 6 Hrs. @ .10c an hour.	.60
	$2.40
Spraying Materials—	
15 lbs. Bluestone @ .12c a lb..	$1.80
5 lbs. Lead, Arsenate @ .12c a lb.. .	.60
15 lbs. Lime @ .01c a lb.	.15
	$2.55
10% Depreciation on spraying machine, First cost, $60.00	$6.00
Total	$10.95

That spraying potatoes will yield a handsome profit per acre with a minimum expenditure of labor can readily be seen from the foregoing results, and as it is an absolute necessity to apply poison in some form, in order to control the potato beetles, the spraying machine will furnish an easy means of applying the poison and at the same time more than pay for itself if used to apply the Bordeaux Mixture for the control of Late Blight.

The Bordeaux Mixture is cheap and easily made.

C. H. HODGE,

Demonstrator, Richmond Co.

WELL INSTRUCTED.—Yells from the nursery brought the mother, who found the baby gleefully pulling small Billy's curls.

"Never mind, darling", she comforted. "Baby doesn't know how it hurts".

Half an hour later wild shrieks from the baby made her run again to the nursery.

"Why, Billy", she cried, "what is the matter with baby?"

"Nothing, muzzer", said Billy, calmly; "only now he knows".—*Tit-Bits.*

THE FARM AND FARM CROPS

SPRING CULTIVATION

Conditions of Plant Growth

IN the course of a few weeks it will be necessary for farmers to commence preparations for spring seeding. The past autumn was an open one and as a result plowing is well advanced, but there is still the spring cultivation and the preparation of the seed bed that require attention, before the necessary seeding operations are completed.

Crops depend upon the soil for the major part of their requirements. These demands must be catered to and any deficiencies which exist in the soil must be remedied in successful agriculture.

Crops require plant food, moisture, warmth, air and sunlight in their growth. As to moisture some three to six hundred pounds of water are required in the production of one pound of dry matter with our ordinary field plants. Warmth is necessary before growth can take place. Air is necessary for the liberation of plant food, without which plants cannot thrive. All these requirements may be influenced and controlled by proper methods of cultivation, and it is towards this end that we must bend our efforts at this time of year.

Why cultivation is necessary

Although in this part of the country there is sufficient rainfall to supply a crop with all the moisture it needs, yet it does not come at the proper time, and frequently we find our crops withering and suffering from lack of water during the growing season. This deficiency may be prevented by storing up the moisture from one season to another by good cultural practices. Of these practices, fall plowing is probably the most essential one in storing moisture, but the formation of a mulch by means of spring and summer cultivation must be resorted to, to conserve it.

To prevent the loss of moisture then, in the spring, all land should be cultivated, as soon after the surface water has drained away and the land can be harrowed without injury to its texture. This breaks the capillary tubes, prevents the formation of a crust and forms a mulch. This in turn hinders the rise of moisture to the surface and so checks evaporation. In case land dries out for seeding faster than it can be sown, all the land should be harrowed immediately so that this loss of moisture may be prevented.

Early spring cultivation may also be of use in warming up the soil, and allowing of earlier seeding. The harrowing of land dries out the first few inches and the mulch thus formed checks the evaporation of moisture from below. As evaporation is a cooling process it follows that the soil warms up faster and makes earlier seeding possible. If these precautions are observed, much moisture will be saved and carried over to a time when the supply is more limited and the demand greater. Further, warmth for plant growth will be supplied at an earlier date than would be the case if spring cultivation was not given.

Preparation of the Seed Bed

The proper preparation of the seed bed is an operation understood by few, and farmers as a rule pay far too little attention to this phase of cultivation. It should not be expected that good returns can be gotten without the soil being in condition to comply with the demands of the crop. A great deal of time, labor and good seed are wasted through inadequate treatment or insufficient cultivation at this stage.

A good seed bed should be in a suitable condition for the seeds to germinate. The soil should be sufficiently open to allow of the ramifications of roots for plant food and moisture. It should be firm enough to draw moisture from the subsoil yet not so close as to prevent the growth of roots and the entrance of water or air into the soil. It should be sufficiently fine and mellow to make possible a ready supply of plant food. Finally it should have a fine mulch to conserve moisture.

The double action cutaway harrow is a splendid implement for this purpose. Next to the plow it is the most efficient implement in pulverizing and fining the soil that we have. One single disking with this cultivator is more effective than a double disking with the ordinary disk, and it does the work at a smaller cost. Three horses and one man will do as much work as will four horses and two men with the ordinary disk. Further than this it has the advantage that the land is left level instead of being thrown up into ridges.

Apart from this double cutaway disking which is advisable for all lands, the amount of cultivation will depend on the character of the soil. One stroke with the smoothing harrow to complete the pulverization is generally needed but if the land is lumpy it will require rolling before it is seeded.

Method of Seeding

As to the method of seeding, drilling is preferable to broadcasting for many reasons. The seed is distributed more evenly, it is covered to a uniform depth and so is in close contact with the moisture. This results in a quick uniform germination and a more uniform stand of plants, which in turn ripen more evenly and produce a better quality of grain. Further a difference in yield of from one to five bushels per acre in favor of drilling is usually obtained. This difference, however, decreases according as good preparation of the soil increases.

Treatment after Seeding

Treatment after seeding will depend upon the character of the soil. Soils that are heavy may need nothing more than the harrow to finish the covering and to form a more complete mulch. Lighter lands will need the roller to firm the soil and to press it into closer contact with the seed followed by the harrow to form a mulch.

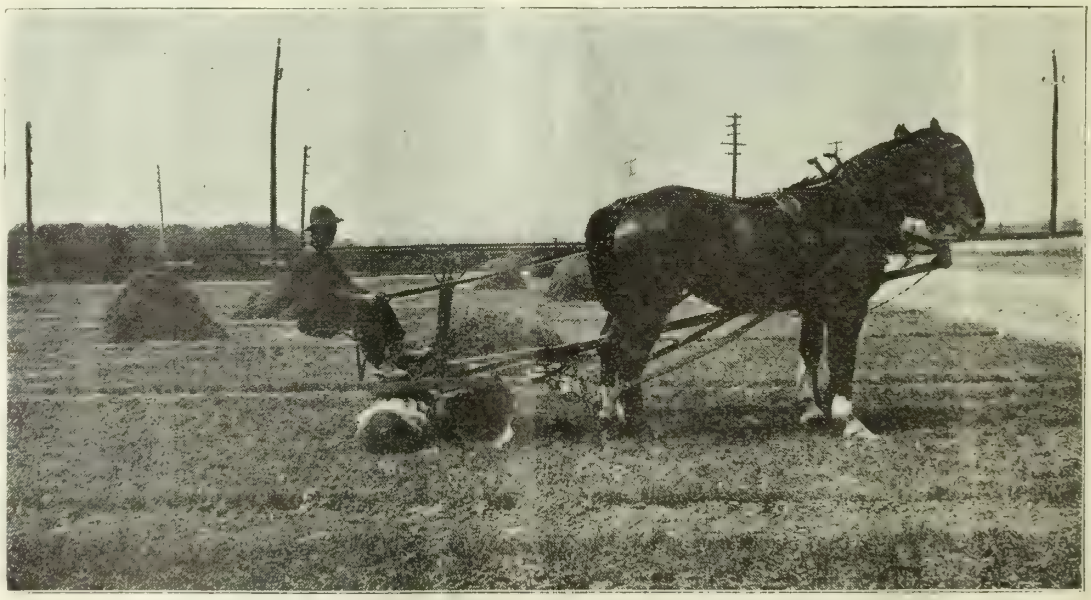
In case land is weedy, or in case heavy rains from a crust on the surface of the soil after seeding the tilting harrow or weeder may be put over the land when the grain is four to six inches high. This will prove effective in killing millions of weeds, in breaking the crust and in forming a mulch to prevent further evaporation. The amount of tilt or slant given to the harrow will depend on the soil. If the soil is heavy and the crust hard, the tilt will need to be set nearly straight, whereas if the land is light more slant will need to be given to prevent the plants from being pulled out. If proper precautions are observed the slight injury to the plants as a result of this harrowing will be more than offset by the number of weeds killed and the amount of moisture conserved.

This operation cannot be practised before the plants are at least three inches high, nor when land is seeded to grass or clover, as it will kill the young plants at this stage, just as effectively as it will kill the weeds. When seeded down cultivation must cease as soon as the covering of the seed and the formation of a proper mulch has been completed.

The preparation of the seed bed forms but a small part of the cost of crop production. The difference between good preparation and poor preparation runs in the neighborhood of forty to fifty cents per acre, whereas the total cost of production including rent of land, cost of plowing, seeding, harvesting and threshing may run anywhere between six and ten dollars. The increase in yield from good preparation would need to be a little more than one bushel of oats or three quarters of a bushel of wheat to make the outlay profitable. In actual practice increases of ten and fifteen bushels are not uncommon. No further argument should be needed to show the importance of paying proper attention to the preparation of the seed bed.

While the preparation of land for grains is important, and a good seed bed may mean the difference between a good profit and a loss (which is always big) yet it is much more important that the soil for grass and clover seed should be well prepared. Grass and clover seeds are small and unless land is in good condition many of the seeds will either not germinate or will not have sufficient energy to overcome the adverse conditions in which they are placed. Many dollars worth of seed are lost in this way every year. Grass seed is too expensive to throw away on land prepared in a haphazard manner. Further a poor stand of hay is a very expensive proposition in that the loss therefrom lasts for a number of years instead of one, as is the case with our cereal crops. Only by sowing plenty of good seed on properly prepared soil may we expect to obtain good crops of grass and clover hay.

Land that for any reason requires spring plowing is apt to be loose and open below, and hence is apt to dry out. It has not had the beneficial



The double Cutaway disk harrow—very useful in preparing corn land. Here shown cultivating Alfalfa.

pulverizing action of the frost, nor has it had time to settle. This means that it requires firming, by means of rolling or packing, to establish proper moisture conditions with the subsoil, and then a great deal of cultivation to prepare the seed bed. On such land, if it is not too wet, the roller and harrow should follow the plow immediately. Land plowed in the morning and forepart of the afternoon should be rolled and harrowed before leaving the field in the evening. This will prevent a great loss of moisture by evaporation that would otherwise take place.

The remarks made regarding the preparation and seeding of land plowed in the fall apply equally well to spring plowed lands.

Probably in no other way can we hope to make greater gains in the production of our crops than by the improvement of our methods of cultivation, and this to a large extent must be done in the spring. The best varieties, good seed, and last but not least, the proper preparation of the soil are essential to profitable crop production.

R. SUMMERBY,

Macdonald College

SEED FAIR OF THE HUNTINGDON AGRICULTURAL SOCIETY, DIV. A.

THE annual seed Fair of the above Society was held at Huntingdon, Que., on Feb. 11th, in the Auto show rooms of A. A. Lunan, kindly loaned for the occasion. There was a much larger entry than last year and a larger attendance of visitors, indicating that greater interest is taken in the improvement of seed. The Department at Quebec placed seventy-five dollars at the disposal of the Society for this purpose all of which, and two dollars more, was paid in prizes.

The judge, M. E. Honey of Abbotsford, Que., was one of the graduates of Macdonald College who has gone back to the farm and is putting into practice the knowledge gained at the College, with marked success. Mr. Honey expressed himself as well pleased with the fair, and considered that the samples of grain shown were superior to the exhibit of last year, being purer in quality and free from weed seeds. He said that some of the exhibits of potatoes had not been well sorted, as they were not uniform in size and shape. The exhibit of Dent corn, "Golden Glow" and "Wisconsin No. 7", was equal to samples grown in Ontario.

The judging class brought out seven competitors in the men's and sixteen in the boys' class. Flint corn, oats and wheat were judged and some good scores were made. So good a score was made by the boys that won 5th, and 6th, places that the judge highly commended and commended them. Much interest was manifested in this department of the Fair, both by competitor and visitors.

The following were the winners and the awards:—

Banner Oats

A. W. McNaughton	$3.00
J. T. McCartney	2.50
Michal Smith	2.00
George Moore	1.00

Oats, White, any other variety

Herbert Cunningham	$3.00
A. W. McNaughton	2.50
T. Ouimet	2.00
Douglas Moore	1.00

Barley

Herbert Cunningham	$3.00
Roy Sparrow	2.50
J. T. McCartney	2.00
McNaughton Bros.	1.00

Spring Wheat

Douglas Moore	$3.00
T. Ouimet	2.00
Jas. Ritchie & Son	1.00

Peas

Geo. Moore	$3.00
Douglas Moore	2.00
T. Ouimet	1.00

Beans

McNaughton Bros.	$1.50
Percy Buckham	1.00
Geo. Moore	50c.

Buckwheat

Angus McNaughton	$1.50
P. Monique	1.00
A. W. McNaughton	50c.

Flint Corn

W. J. Moore	$2.00
Ernest Friar	1.50
T. Ouimet	1.00

Dent Corn

Percy Buckham	$2.00
Jas. Ritchie & Son	1.50
A. W. McNaughton	1.00

Flax

Geo. Moore	$1.50
Douglas Moore	1.00

Timothy

Jas. Ritchie & Son	$3.00

Potatoes, White

Herbert Cunningham	$2.00
A. W. McNaughton	1.50
Jas. Ritchie & Son	1.00

Potatoes, Red

R. T. Ouimet	$2.00
David Pringle	1.50
J. T. McCartney	1.00

Judging Competition, Boys' Class—Not over 18 years of age

Harold Oliver, 207 points	$2.00
Gordon McLean, 178 points	1.50
Joe Tallon, 175 points	1.00
Emerson McNair, 173 points	50c.

Judging Competition, Men's Class, over 18 years

Geo. Moore, 182 points	$2.00
Edmund Ouimet, 160 points	1.50
A. W. McNaughton, 137 points	1.00
Ross Pringle, 136 points	50c.

BACTERIA IN FROZEN SOILS

FOR many years investigators have studied the bacterial conditions in soils when different crops were growing in them, and their findings have been of material benefit to agriculture. In the winter months, however, when everything is covered with a layer of snow and agriculture is at a standstill the soil has seldom received any attention from bacteriologists. The general opinion was that as the soil was frozen bacterial activities came to a standstill. It caused, therefore, considerable surprise when a soil examination made in midwinter not only showed the presence of soil bacteria, but showed them to be more numerous than in the middle of the growing season. This first investigation was soon followed by others, and although a study of frozen soils is limited more or less to the Northern part of the continent and the work is rather cumbersome, at present we have sufficient data to draw some very useful conclusions, and the fact that bacteria are extremely active in frozen soils is firmly established.

Probably the matter can be explained in the following way. In summer we have in the soil a number of vigorous bacteria which demand large quantities of organic material for their sustenance. In the fall these bacteria are checked by the lower temperature, and by the time the soil freezes their development is practical at a standstill. However, there are in the soil other bacteria, too weak to fight the strong summer varieties, which prefer food of less concentration than that available in summer. As soon as winter puts a stop to the growth of their strong competitors these weaker species begin to develop and when the frost is at its height their total runs into tens of millions per gramm of soil. As soon as the spring weather comes, and supplies in the thawed soil more abundant food, they cannot continue any longer the struggle for existence against the revived summer bacteria.

Bacteria in the soil are important for their activities, that is for their ability to transfer refuse material into plant food or to destroy plant food. The principal functions are *ammonification*, that is the making of ammonia out of refuse matter of animal and plant life; *nitrification*, the changing of this ammonia into nitrate,— the available form of nitrogen for plants; *denitrification*, the destroying of the valuable nitrates; and *nitrogen fixation*, or the change of atmospheric nitrogen into nitrates.

These four important functions are affected by the winter conditions. Ammonification becomes more lively than in the growing season. Nitrification is very much reduced, but still takes place to a moderate extent. Denitrification is about the same in winter as in summer, and nitrogen fixation is entirely at a standstill.

The matter has not been studied sufficiently to draw definite conclusions from these facts, but we must expect a large supply of ammonia in the soil when the spring thaw comes. It has often been observed that there was a strong ammonial smell in that period, which was usually ascribed to the accumulation of manure on the roads during the winter season, but is probably a result of large quantities of ammonia being in the soil. In winter we have no crops to utilize the plant food made available; an accumulation of soluble compounds might be occasioned and the loss of such materials by early spring leaching would be of considerable economic importance. On the other hand these soluble plant foods might be absorbed by bacteria, so that there would be hardly any accumulation, and the complex food of the bacterial bodies would be later available for transformation into plant food.

Future investigations will have to solve these questions, but the results obtained so far will help to explain why, for example, it is advisable to plow under green manures in the fall, for such materials must be acted upon by bacteria to be of value to crops, and similar agricultural practices.

J. VANDERLECK

WILD MORNING GLORY OR BINDWEED

Editor, Journal of Agriculture,—

WILL you please advise me what will kill out Wild Morning Glory vines. I have a piece of land that it has taken possesion of in spite of everything that I can do, and it is still spreading. Any advice that you can give will be thankfully received.

C. F. F., Philipsburg, P. Q.

ANSWER:—I may say at the outset that this weed is one of the most difficult of all our weeds to eradicate. It is a perennial which sends out running root-stocks in the soil, and practically any piece of the creeping root is capable of throwing out a bud and starting a new plant. The plant also produces flowers, but the chief method of dispersal is by means of large creeping roots.

Careless cultivation, it will be observed, will do much to spread the weed on a farm. I mean by this that cultivators frequently carry the weeds from one part of the field to another. It is a good plan therefore whenever a patch of this Wild Morning Glory or Bindweed is observed in the field to cultivate it apart from the rest so as not to spread the weed.

With regard to its control frequent introduction of hoed and smothering crops will gradually weaken it so that finally the remains can be removed by hand or with a spade. Late sown hoed crops, especially rape, are very effective, in fact more so than those sown earlier in the season. Before the rape is sown a broad-shared cultivator should be run frequently over the infested field so as to cut all the plants an inch or two below the surface without bringing up any of the rootstocks.

Early in July the land may be sown with rape in drills, say 26 inches apart and during the early growth of the crop the weeds may be kept in check by means of the horse hoe, with more or less hand hoeing. If the rank growth of rape and the cultivation have not eradicated the weed, corn should be introduced the following year. With the careful cultivation that should be given to this crop it is very likely that the weed will be banished. It may be advisable sometimes to adopt a summer fallow, and in such cases it is best not to plow more than is absolutely necessary, but to depend mainly on the broad-shared cultivator. Buckwheat sown on summer fallow and plowed under when coming into blossom, followed by surface cultivation will assist very much in killing this weed, and if necessary the summer fallow should be followed by a hoed crop.

W. L.

LIME AND SOIL

Its Properties and Action on the Soil

LIME has long been considered one of the essentials in crop production. The work of the various experiment stations has now shown conclusively that soils which respond profitably to liming, either on account of their acid condition or of a deficiency of lime in other respects, are very widely distributed.

In case a soil is seriously deficient in lime, gypsum may act as a direct manure; usually, however, its beneficial effect upon soils is attributed to its indirect action in liberating potash and possibly other substances which were locked up in the soil in such combinations that plants could not make use of them. Gypsum may be helpful to a limited extent on clayey soils by flocculating the fine particles, on account of which the soil is less likely to become "water-logged" and to cake, and hence interfere with the operations of tillage. In the last-mentioned respect water-slaked lime or the carbonate is said to be much more efficacious than gypsum, though as a liberator of potash, gypsum is claimed to lead. Some so-called marls contain considerable quantities of phosphoric acid and potash in such forms as to greatly enhance their fertilizing value.

Uses of Lime Phosphate

Phosphate of lime is found as bone, guano, apatite, and in the form of the well-known South Carolina, Florida, and Tennessee phosphate rock. The better classes of phosphate rock contain but small quantities of carbonate of lime, while others contain large amounts. The latter are unfitted on this account for superphosphate manufacture. Both classes of phosphate when ground finely have been found to be more or less effective upon acid soils, particular attention having been devoted to their employment on acid muck or peat soils. These phosphates not only seem materially to reduce the acid character of such soils, but after having been in contact with them for some time the assimilability of the phosphoric acid seems materially to increase. The lower-grade phosphates, containing considerable quantities of carbonate of lime are particularly effective upon acid soils.

In employing undissolved phosphate rock upon acid soils, certain authorities recommend following the application of the phosphate at an interval of some months, or, if possible, a year, with a dressing of lime. This delay in liming seems to be a reasonable recommendation.

Superphosphates, which are prepared by treating phosphate rock, bone, and boneblack with sulphuric acid, generally have about one-third of their lime combined with phosphoric acid and two-thirds with sulphuric acid. The lime combined with sulphuric acid is nothing more nor less than gypsum (land plaster). For this and other reasons superphosphates may not work as well on acid muck or peat soils as ordinary undissolved phosphate rock or ground bone, and if, as is sometimes the case, a slight excess of sulphuric acid is present, they may even have a temporary injurious action upon upland soils which are deficient in carbonate of lime.

Many kinds of lime are available for agricultural use, among which are caustic or burnt lime, or quicklime, which should contain at least 90 per cent. of actual lime and is the most concentrated form of this material; gypsum, or land plaster, in which the lime is in the form of the mild sulphate; ground limestone and chalk, in which the lime is in the form of the mild carbonate; different kinds of marl, containing varying proportions of sand and clay and from 5 to 95 per cent. of carbonate of lime; wood ashes, which contain from 30 to 35 per cent. of lime in the form of carbonate; limekiln ashes, containing about 40 per cent. of lime, and waste lime from gas houses and sugar manufactories.

Carbonate of Lime Preferred

It is impossible to state definitely for all locations and conditions what kind of lime is cheapest to use. Caustic or quicklime is the most concentrated, and consequently the most economical to handle. On account of its caustic properties it is more vigorous in its action than the milder sulphate (gypsum) or carbonates (limestone, chalk, wood ashes, marl, etc.). There may be special reasons, however, why some of the latter may be preferable. For instance, gypsum, on account of its peculiar composition, has been found to be a specially valuable corrective of black alkali.

It has been shown that carbonate of lime and such other compounds of lime as are changed into the carbonate by decomposition within the soil all tend to favor the production of potato scab, provided the germs of the disease are already in the soil or are introduced into it on the seed tubers. This seems to be due to the fact that the lime makes the soil alkaline or to some influence which the combined carbonic acid of the carbonate of lime exerts upon the development of the fungus. In view of this unfavorable action of lime, caution should be observed in liming potato fields.

Many writers seem to agree that liming is capable of lessening materially the injury to turnips, cabbages, etc., caused by the disease known as "finger-and-toe" and "club root." English writers assert that by resort to liming excellent crops of turnips have been produced where without it the crop was a failure, owing to the attacks of the disease.

Excess of Lime Injurious

The effect of different compounds of lime has been tested, with not entirely conclusive results, on various other diseases, including cranberry and sweet potato diseases, and a root disease of alfalfa (Rhizoctonia medicaginis). Slaked lime was found to be effective in reducing soil rot of sweet potatoes, and quicklime in checking or preventing the root disease of alfalfa.

If manure and lime are mixed and at once plowed under, the earth will probably arrest most of the ammonia that may be found; but if the mixture of manure and lime is exposed to the air, there will be considerable escape of ammonia into the atmosphere.

In the case of wood ashes, the lime is first in the form of oxide or quicklime, which reverts to the carbonate form on exposure to the atmosphere, so that fresh ashes would have the same effect as quicklime in liberating ammonia. Ground limestone would have less tendency in this direction, but the safest plan is to apply all kinds of lime or limestone separately from manure or fertilizers.

Many important changes are produced in the soil by organisms so small that they can only be observed by the aid of the most powerful microscopes. Some of the changes of this character in which lime plays an important part are the following:

1. The change of ammonia and of nitrogen in organic matter, such as blood, meat, fish, tankage, plants, etc., into nitrates, the form in which it is chiefly assimilated by most cultivated plants. This is known as the process of nitrification, and is promoted by the presence of lime in soils.

2. The decomposition of organic matter in muck and other soils. In this process the production of carbonic acid is much accelerated by the use of lime. This carbonic acid, in turn, so acts upon the inert plant food of the soil as to make it more quickly available to plants. The indirect result, therefore, is to help the plant to draw more potash, phosphoric acid, etc., from the soil than would otherwise be possible.

LIVE STOCK

QUEBEC HOLSTEIN BREEDERS MEET

THE Holstein Friesian Association of Canada, Quebec Branch, held its Annual Meeting at the Queen's Hotel, Montreal, on Tuesday February 1st, 1916.

The President, Mr. P. J. Salley, was in the chair, and Mr. Donat Raymond was the Secretary. There was a large and enthusiastic meeting.

Since the date of the last Annual Meeting of this Association, its members have been called to mourn the loss of their distinguished colleague, Mr. Ogden Sweet, of North Sutton, Que., who held the office of 1st Vice-President of this Associaton with no less honor to himself than credit to the Association; and also of Mr. G. K. Herrick, of Abbotsford, who was the first President of this Association; it was therefore

RESOLVED that this Association have learned with profound sorrow of the death of the late Ogden Sweet, and G. K. Herrick, and that they highly appreciate the varied and excellent work which they brought to the discharge of their duty and the manifold services they rendered to this Association, for whose welfare they worked with never-flagging zeal.

IT WAS FURTHER RESOLVED that this resolution be recorded on the minutes of this meeting and a copy be transmitted to the family of our deceased friends.

The following members were elected officers for the ensuing year:—

Hon. J. Caron, Minister of Agriculture, Quebec, Honorary President
Dr. L. de L. Harwood, Vaudreuil, President
Neil Sangster, Ormstown, 1st Vice-President
Joseph Ferland, Sorel, 2nd Vice-President
R. E. Gillespies, Abbotsford, 3rd Vice-President
D. Raymond, Montreal, Secretary-Treasurer.
Directors:—
Felix Ashby, Marieville
Andrew Boa, Genoa
Adelard Forget, St. Sebastien
W. I. Bishop, Montreal
Hubert Gladu, Marieville
D. H. Brown, Beith
P. J. Salley, Lachine Rapids
Rodrigue Beauregard, Damase
A. N. Laberge, Chateauguay Basin.

After the adjournment of the business meeting, the banquet prepared in the popular manner of the Queen's Hotel was had, and the new president, Dr. Harwood, acted as toastmaster.

Professor Barton of Macdonald College delivered a very interesting address on the subject of the best feeds to obtain the best results and also on the importance of selecting good specimens of the breed in the foundation of a herd.

There were also speeches by Mr. Brown, of Beith, Neil Sangster, of Ormstown, W. I. Bishop, of Montreal, C. E. Noiseux, of St. Jean Baptiste de Rouville, and others.

A delegation of several members went to Toronto to attend the Annual Meeting of the Association.

THE DEVELOPMENT OF THE DAIRY HERD

Synopsis of an Address by Prof. Barton at the Ottawa Winter Fair

COMMERCIAL dairying is based on the graded stock. Some of the failures to-day have been due to lack of thoroughness, poor treatment of good stock in the branches of development and breeding. There is only one way to grade—that is through a purebred sire. We must, however, go farther. The bull must be a good bull. We must have better livestock because we are working on a smaller margin to-day than we were a few years back.

Starting out with the calf, the younger the better, it should be the product of a proper mother who has had two months' rest against ten months' work before the calf comes, so that she is in good condition at time of calving.

Fall calves are very desirable; they often make the greatest growth and are the most thrifty. Time of calving is of vital importance. Keep an eye out for trouble; provide best conditions possible. Mother's milk for the calf is imperative. Remember the delicacy of a new-born calf and avoid blunders, especially that of over-feeding. Maximum amount for good big calf, 10 lbs per day or 1 gallon. Whole milk at first is indispensable, and two weeks on this is the minimum; then skim milk. Be careful with this, and let the change be gradual. Don't change at once but add a little each time until skim is wholly substituted. Get the calf to the maximum 20 lbs. to 24 lbs. per day in as reasonable time. Supplementary feeds, with skim milk, show oats as a splendid basis. A little of wheat, corn, oilcake, blood meal, can be used here and all have value. Rolled oats are valuable in conjunction with skim milk. Scalding feed, or steaming, to make more palatable, helps. Last month with the calf on milk, whether it be at 5, 6, 7, 8 months, is very important. Top notchers run to about 9 or 10 months. Grass for calves is often abused, and the calf should be kept in as long as possible. If spring calves, keep in until three months old, because early summer is a bad time to go out on account of flies, heat, etc. Again, the calves should be well developed before going to grass. A grass paddock is valuable and may consist of after grass, but in any case it must be fresh. Provide shade. Keep on the supplementary feeding, and wean off gradually. Whole oats are the best at this stage.

Wintering the Calf

Heifers sometimes come out of stable in spring in worse condition than when they went in, and yet while in winter quarters they should have had one of the best opportunities for development. A large run with plenty of good water and shade will do much to overcome poor wintering, but both periods—winter and summer—are equally important and with a shortage of grass the winter period must be relied upon for more growth than is the usual result. Here, however, we must insure economical feeding. The fodder should be cheap and good; lots of roughage; cheap bulky foods happen to be best suited. First in order and an ideal roughage is silage, then roots. "Turnips and silage are an ideal combination." Both clover and alfalfa hay, whilst very excellent as feeds, may be quite expensive. They are not always grown successfully, and for this reason might well be limited to stock in milk and the young stuff. An ideal rough hay feed is peas and oats. It is excellent with silage and roots, and a big yielder; does well on old meadow land or pasture land if necessary. Sow two bushels oats and one bushel of peas per acre. "We use Banner oats and Prussian Blue peas." Cut in the milk stage, cock and cure. Be careful here, as it is difficult to cure properly. Any dislike the cattle have to this feed may be overcome by using a little molasses mixed in water and sprinkled on the feed in the manger.

Breeding Advice

Avoid the pitfall of breeding too early. Don't be in too big a hurry to bring the heifer into milk. Forced breeding results in a weak cow and a poor offspring. Let the heifer get proper development and not drop a calf before she is at least 30 months of age. Experience proves the value of this advice. After her calving, be careful with the cow. Give her a fair chance. Provide exercise, or, better still, a box stall of good size. Avoid heavy feeds. Provide her with a little bran and oats and perhaps a little oilcake to keep her bowels in good shape. Tone up her system if she seems to need it (after calving) with Epsom salts, at least 1½ lbs. at a dose. Be kind. Give her udder particular attention. In her first year in milk, be careful to handle and train her properly. Ten months, or better, twelve, in milk and then give her a good rest to get ready for her second year.

SOME FLOCKS, HERDS AND FARMS OF THE BEDFORD DISTRICT

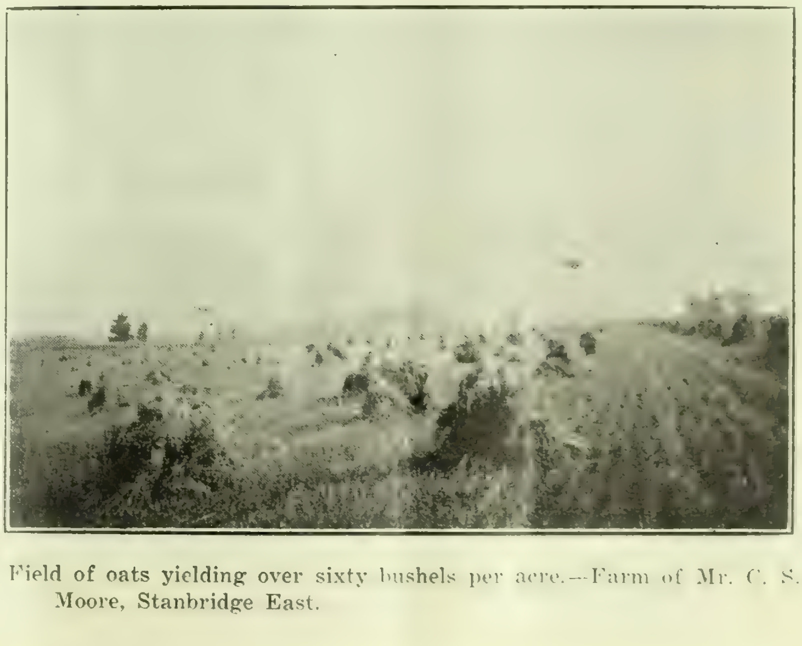
X. A Farm Improved by Intelligent Management

MR. C. S. Moore of Stanbridge East is one of the comparatively few college-bred farmers of the province. Mr. Moore graduated in the New York State College of Agriculture, Cornell University, in 1894 and has been on his home farm ever since. For the first three years he had the co-operation of his brother, Dr. A. E. Moore, afterwards appointed Government Inspector at Ottawa, and together they began improvements. Mr. Moore speaks modestly of what he has accomplished during those twenty-one years, but when he contrasts the conditions of farming and living at the two ends of that term of years he feels a certain amount of satisfaction. The progress made, if not sensational, is at least real and substantial. At the commencement of his career as a farmer, owing to a division and rearrangement of an estate, Mr. Moore had a run-down, stony farm of about ninety acres, stocked with three or four cows and one good horse. The house was a good one, but crowded in amongst other village buildings. The barns were also good buildings but inconvenient. There was no machinery on the farm and the manure was allowed to waste in compost heaps left standing for years at a time. Milk sold at 50 to 60 cents and pigs at $3.75 a hundredweight.

To-day Mr. Moore has a house equipped with modern conveniences and with spacious surroundings, the adjoining village lots having been purchased and cleared of buildings. A comfortable cottage has been built to house his farm help. His farm buildings have been re-arranged so that everything is now under one roof, including a covered barnyard — an item significant of the care now taken to conserve the fertility of the farm. Plank floors have been replaced by cement. The barn has been fitted with lightning rods, a job which Mr. Moore completed in one day, including the making of the cable. A stave silo, built about 20 years ago, has been in service ever since and has just been discarded to be replaced, probably, by one of cement.

Hundreds of loads of stone have been removed from the land and about twenty acres of the wettest land have been underdrained. In an article published in the Journal a few months ago Mr. Moore explained how he did the underdraining. He regards this as the best investment he has ever made and he intends putting every spare dollar into the ground in this way, until he has the farm fully equipped with drains. When this is done he will be able to put the whole farm under a regular rotation of crops.

The farm now has a full equipment of machinery



Field of oats yielding over sixty bushels per acre.—Farm of Mr. C. S. Moore, Stanbridge East.

Residence of Mr. C. S. Moore, Stanbridge East.

including, besides the ordinary tools necessary on any farm, a manure spreader, a two-row cultivator, a two-horse corn planter, a grain drill, a horse-fork in the barn and a complete set of potato machinery.

The dairy herd has been increased and improved by the use of pure bred Holstein bulls until the five cows and nine heifers now in milk promise to average over 5000 lbs. for the season, and Mr. Moore estimates that when the heifers are mature the average will rise to 7000 lbs. Mr. Moore markets cream locally and uses his skim milk in feeding pigs of which he markets 40 or 50 annually. He grows about 1000 bushels of potatoes a year. Other profitable side-lines are strawberries, which sometimes bring in as much as $200, and poultry, the flock consisting of about 80 pure bred Plymouth Rocks. Mr. Moore would like to keep a flock of sheep, but owing to the serious menace of dogs in this locality, and what he regards as the inadequate protection afforded by the present sheep and dog act, he does not care to incur the risk.

A portion of Mr. Moore's farm has recently been taken over by the Dominion Government as an "Illustration Station".

J. F. S.

CANADIAN AYRSHIRE BREEDERS' ASSOCIATION

Annual Meeting

THE annual meeting of the above Association was held in the Carls-Rite Hotel, Toronto, Ont., on Feb. 3rd. There was a large number of members in attendance.

The President, A. H. Trimble of Red Deer, Alta., in his address referred to the progress dairying had made in Alberta and how popular was the Ayrshire in the West. She stood the winters better than any of the other dairy breeds and this, combined with her large production of milk rich in fat, was making her a very popular cow.

The Secretary, W. F. Stephen, of Huntingdon, Que., made his Annual Report, a summary of which is given in another column.

The chief item of business was the amending of the Constitution as a whole so that it would meet present day conditions.

It was decided to grant Diplomas to bulls that have qualified in the Record of Performance test with four of their progeny, the Diploma to go to the owner of bull at time of service.

It was recommended that the provincial laws be amended so that a provincial license may be granted to Live Stock Auctioneers.

The question of making the marking of Ayrshires compulsory by tattooing numbers in the ear was discussed but no action was taken.

$1500. was voted as grants to exhibitions and $650. to Dairy Tests, and at Guelph, Amherst and Ottawa Winter Fairs, $100. additional was offered, provided classes for senior and junior yearling bulls were put on.

The general tone of the meeting showed that steady progress was being made in the improvement of the breed, and it is responding nobly to the thoroughness and intelligence which Ayrshire men are putting into the development of "Our Favourites", as they term their Ayrshires. The future of the breed was touched upon by men from many parts of the Dominion, the concensus of opinion being that prospects were bright in every province, especially Alberta.

The slogan of the Association for 1916 is, — "More cows entered in the R.O.P. test", "Bigger Records", "Many new herds started", and "Bigger and better exhibits at our Fairs and Exhibitions.

The following officers were elected:—President, M. St. Marie, Compton, Que.; Vice-President, W. W. Ballantyne, Stratford, Ont.; Secretary-Treasurer, W. F. Stephen, Huntingdon, Que.; Auditors, Gilbert McMillan, Trout River, and J. P. Cavers, Ormstown, Que.; Directors, R. R. Ness, Howick, P. D. McArthur, Howick, James Bryson, Brysonville, Hon. Wm. Owens, Montreal, L. J. Tarte, Montreal, M. St. Marie, Compton, Que., Fred McRae, Charlottetown, P. E. I., W. W. Ballantyne, Stratford, Ont., John McKee, Norwich, Wm. Stewart, and Alex. Hume, Campbellford, A. S. Turner, Ryckman's Corner, Frank H. Harris, Mt. Elgin, Ont. and A. H. Trimble, Red Deer, Alta.

The Banquet held on the evening of Feb. 2nd, in the Carls-Rite Hotel, was the most successful yet held and was addressed by Dr. C. C. James, Toronto, H. A. Craig, Edmonton, Alta., Dr. H. S. Tolmie, Victoria, B. C., Prof. H. Barton, Macdonald College, Que., and others.

AYRSHIRE RECORDS

THE following is a summary of the records of 683 Ayrshire cows and heifers that have qualified in the Record of Performance test from commencement to December 31st, 1915.

202 mature cows gave a yearly average of 10277.-32 lbs. milk and 412.26 lbs. butter fat.

66 four year olds gave 9281.50 lbs. milk and 378.06 lbs. butter fat.

136 three year olds gave 8340.84 lbs. milk and 344.25 lbs. butter fat.

279 two year olds gave 7501.65 lbs. milk, and 309.27 lbs. butter fat.

W. F. STEPHEN,

Huntingdon, Que. Secretary-Treasurer.

CANADIAN AYRSHIRE BREEDERS' ASSOCIATION

Condensed Report of the Secretary

IN the march of time it is again my duty, privilege and pleasure to report favourably on the work of the past year.

The dairy business was never better. There has been a larger production of cheese and butter and the higher prices realized for these products have been a great incentive to increase the output.

The demand for market milk and cream of high quality is rapidly increasing, especially in our large cities.

With this comes an increased demand for cows of good breeding to supply this high-class milk. A number of large dairy companies now pay for milk on the basis of the butter fat content which is recognized by leading authorities to be the fair and just method of payment.

This is decidedly in favour of the Ayrshire, and more and more is she coming to her own in the dairy world, because of the uniformly *high quality* of her milk, *her persistent* milk flow and *economical* production.

I am pleased to report a marked advancement in every line of our Association work. Especially is this true in the number of new breeders that have joined our ranks. The promising feature is that most of these are young men, whose enthusiasm and energy will be a stimulus to better effort on the part of all, and to the further development of the breed.

Nothing sensational has occurred in records or in other phases of our work. But it is worthy of note that a Canadian bred Ayrshire brought the highest price, at public auction, ever paid for an Ayrshire cow. This cow was "Jean Armour"—15591—"25487", bred by H. & J. McKee, Norwich, Ont., and was bought at the auction sale of Mr. W. P. Schanck, Avon, N. Y. last August by Mrs. Erhardt of the Lotus Fields, W. Berlin, N. H. and for her was paid the handsome sum of $4000.00. This cow has an official record in the United States of 20,174 lbs. milk and 905 lbs. of butter.

1915 will be known as the year Ayrshires passed the 25,000 lbs. milk record, as the cow "Garclaugh May Mischief" (Imp.) owned by Percival Robert, Jr., Narbeth, Pa., finished her year on December 26th last, with 25328 lbs. of milk and 894.91 lbs. of fat equal to 1052.83 lbs. of butter.

MEMBERS. — I am glad to report 174 new members and our membership on December 31st last was 1197, as follows:— Quebec 565, Ontario 360, Alberta 67, Nova Scotia 51, New Brunswick 36, Manitoba 35, Saskatchewan 27, Prince Edward Island 25, British Columbia 21, and the United States 10.

REGISTRATIONS.—There have been recorded 3682 pedigrees, 1407 transfers and 68 duplicates and new certificates, an increase of 186 pedigrees and 43 transfers over 1914. Ontario leads this year, with Quebec, Nova Scotia, Prince Edward Island and New Brunswick following in order.

EXHIBITIONS.—The dignity of the Ayrshire breed was well sustained at all our leading exhibitions. The exhibit of Ayrshires at Toronto and Ottawa are worthy of special mention. The entries were large, the cattle choice, and the judges had to make their decisions on fine points. There is no better medium to advertise your stock and the breed than by exhibiting at shows and exhibitions.

DAIRY TESTS. — The entries of Ayrshires were more numerous than last year at all these tests and good records were made. At the Calgary and Brandon tests Ayrshires won over all breeds. To make big records in Dairy Tests means early preparation and special fitting of the cow. At the Guelph Winter Fair a breeding class for young bulls, and at the Amherst Fair a class for young heifers were put on which gave increased interest in the dairy classes.

RECORD OF PERFORMANCE.—The yearly test increases in popularity judging by the increased entry. We received 598 entries, and 182 cows and heifers registered in the test in 1915. Only in the three year old class has a record been broken, the heifer "Milkmaid of Orkney"—39834—owned by Harmon MacPherson, Orkney, Ont. having made 14060 lbs. of milk and 534 lbs. butter fat. The Silver Cups offered by the Association for the cow or heifer making the highest score in each class have been awarded as follows: — Mature Class, "Daisy of Ferndale"—26735—with 14032 lbs. milk, 544 lbs. fat, score 12112 points, owned by W. C. Tully, Athelstan, Que.; Four year old class:—"Queen Mary"—43255"—with 11391 lbs. milk, 436 lbs. fat, score 7662 points, owned by Harmon McPherson, Orkney, Ont.; Three year old class:—"Milkmaid of Orkney"—39834—with 14060 lbs. milk, 534 lbs. fat, score 14084 points, owned by Harmon McPherson, Orkney, Ont.; Two year old class:—"Primrose of Beaver Meadow"—33930—with 12350 lbs. milk, 463 lbs. fat, score 12109 points, owned by W. C. Tully, Athelstan, Que.

The awards were made on the following basis:—I point for every pound of milk over the amount required to qualify, 25 points for each pound of fat over the amount required to qualify, and 10 points for each day between the freshening period after calving and the time limit from the commencement of test. All animals to finish their test within the year.

These cups are handsome and have been engraved with the name of the Association thereon, name of winner and name of animal, class and record. The giving of such prizes yearly should be a stimulus to record work.

HERD BOOK.—Volume 24 of the Herd Book of which there were 1800 copies published, has 178 pages less than Volume 23, owing to the fact that we have abbreviated as much as possible. This has reduced the cost considerably.

THE ANNUAL.—This publication continues to be in great demand. Of the 2000 copies of the English edition we only have a few dozens on hand, and the 700 copies published in French was exhausted in October. It is being more widely distributed each year. We endeavour to fill the pages of this publication with information about the breed that will be of interest to its readers. We trust that the dissemination of the information contained in the Annual and Booklet may be of benefit and value to our breeders.

AYRSHIRE RECORDS.—This booklet was increased to 68 pages. It contained the records of 567 cows and heifers and the standing of 28 bulls that qualified in the Record of Performance test. Of the 1000 copies published in English there are only a few hundred left, and the 2000 copies printed in French were all called for months ago. This widespread circulation of our literature brings to public notice the productive ability and other sterling qualities of the Ayrshire and does much to create an increased demand for "Our Favourites".

SALES.—According to the increased number of transfers sales have been more numerous than last year, and at remunerative prices. Breeders are well stocked and look forward to a good trade this Spring. The demand for young bulls from Record Stock is increasing showing the value of Record of Performance work. There have been a number of auction sales during the year, and prices have been good. Breeders find the auction meet a good means of disposing of their stock, as here the seller and buyer are brought together. Comparatively few Ayrshires have been exported to the United States owing to the stringent regulations re cattle exported from Canada.

IMPORTATIONS.—R. R. Ness, Howick, Que., and John Duncan, of Montreal, imported Ayrshires last year. Mr. Ness imported some 15 head and Mr. Duncan about 20 head for Messrs. C. C. and Jas. Ballantyne of Montreal, whose farm is located at Chesterville, Ont.

AYRSHIRE CLUBS.—When the officers and members of these Clubs are alive to their interests considerable can be accomplished by creating a greater interest in a community in favour of our breed. The Clubs already formed,—three in Ontario, one in the West and one in British Columbia, are all doing good work in their own way to advertise the breed. The Southern Counties Club leads in progressive work and through the efforts of this Club many new herds of Ayrshires have been started in that district. There is room for several good clubs in Quebec and the Maritime Provinces and we hope several may be organized this year.

FARM REGISTRATIONS.—We had 48 registrations last year which now makes a total of 202 herd names registered. The registering of a herd name gives the owner the absolute right to use that particular name in connection with the recording of his stock.

FINANCES.—It is gratifying that we close the year with a cash balance of $6226.88, an increase of $514.23 after paying a liability of $1374.48 and $275.00 on Volume 25 of the Herd Book, and have only a liability of $551.56 to carry to the 1916 account.

THE PRESS.—Over 45 periodicals use the copy sent from our office from time to time, such as reports of test, etc. Through this medium the Ayrshire is being advertised as never before. Ayrshire breeders are remiss to their loss in not using the columns of the press more than they do to make known the merits of their herds and the breed.

FIELD WORK.—My duties outside of the office are becoming more numerous, attending Fairs, addressing meetings, demonstration work, registration committee work, all demand more of your secretary's time. This personal intercourse with our men enables me to keep in close touch with them and learn of their needs and grievances and give more definite help. I spent two weeks in Alberta last summer, judging at Exhibitions and met many who were interested in Ayrshires. This trip confirmed my opinion that there is a great field for Ayrshire men to exploit in Western Canada. Besides attending a number of exhibitions in Ontario and Quebec, I visited the Maritime Winter Fair at Amherst, N. S. last December. I saw many of our breeders, discussed problems peculiar to their conditions and hope that a Breeders' Club may be organized in Nova Scotia at an early date.

And now for the future! What are we going to do in 1916 to advance the breed? What shall be our slogan this year? Bigger and better exhibits at our exhibitions. A larger entry in the R.O.P. test. Bigger records and many new herds started. To carry out this programme means greater activity on the part of every breeder of Ayrshires. A strong united effort would bring about an advancement hitherto unthought of, not only in the Ayrshire business, but in the uplift of our dairy farmers and the industry generally.

W. F. STEPHEN,

Secretary-Treasurer,

Canadian Ayrshire Breeders Association,
Huntingdon, Que.

SOME COW TESTING POSSIBILITIES

By Chas. F. Whitley, Ottawa

(Synopsis of an Address given at the Eastern Ontario Dairymen's Convention)

COW testing is recommended because it is a rational method of quickly building up a thoroughly profitable herd. You are well aware that the aim of all cow testing is increased efficiency of all cows kept. If not efficient, why keep them?

Have not some of our patient dairymen "guessed" at things just a little too long? Development through cow testing is permanent, not incidental, and surely true wisdom lies in the discernement of the essential, the lasting. It can never be hard-boiled egotism for any man to say "I've got a good herd, my figures prove it".

Evidently therefore we may except a realization of our dream of increasingly high yields of milk and fat from our ordinary cows. Our cow testing members are stepping into a new track, the primrose way to happiness, exulting in yields of 7,360 lbs. milk and 254 lbs. fat from two year old grades; 11,000 and 15,000 lbs. milk, 400 and 500 lbs. fat in the year.

COMPARATIVE YIELDS

One Herd of Nine Cows, Eastern Ontario

Cow No.	Age	Pounds of milk	Pounds of Fat.
1	6	6,834	255
2	6	4,164	147
3	10	6,255	238
4	6	4,362	161
5	4	7,736	281
6	3	6,590	227
7	3	5,170	209
8	5	7,200	258
9	9	6,642	247

Average per Cow: Income $67.38, Feed $40.00; Net Profit $27.38. All cows fed the same, feed weighed by owner.

These figures of a herd of 9 grades in Ontario are of interest from one or two points of view.

When the average yield per cow as kept in his own herd record book by the owner is seen to be 6,105 lbs. milk, 3.6 test and 224 lbs. fat, it may be considered a fairly good herd. With fat valued at 30 cents per lb. the average income is $67.38, leaving, with feed valued at forty dollars, a net profit from each cow of $27.38.

The lowest yield is from a six year old, giving 4,164 lbs. milk containing 147 lbs. fat, returning a profit of only four dollars. Another six year old is a close second to this record. A three year old is well up above the average, a four year old heads the list with a yield of 7,736 lbs. milk and 281 lbs. fat. This means a profit of forty four dollars, or eleven times as much profit as is made by the six year old. Notice the two extremes, one cow giving actually 3,572 lbs. milk more than the other.

When there is seen to be a difference in income of over forty dollars between two cows receiving the same care and attention, is it not self-evident that individual, not average, merit and efficiency must be considered?

Our records enable us to submit such figures as these: 73 cows last season earned $4,310.59, but 69 cows close by earned $6,694.35. That is, they brought in an extra amount of spot cash to the extent of $2,383.76. Here we have one sample, a clean cut indication of what can be duplicated in hundreds of localities.

I find in the statements forwarded to the office by dairy farmers who keep careful feed records, which we supply free, that at one factory 50 cows made a profit above feed cost of $615.93. At the next factory is a group of 43 cows that cleared a profit of $1,540.36. Does your herd average about three cents profit per day, or more than nine? In district after district in Ontario and the east I find single cows making less than one cent per day profit, while other cows, with a feed cost of over forty dollars, are making fifteen times that profit.

Our records also show that more and more is being appreciated the value of the pure bred dairy sire from a good family. Picking up records of herd after herd, and group after group of grade cows headed by a pure bred sire, I find that the heavy balance in his favour is from 1,500 frequently up to as high as an extra 3,000 pounds of milk per cow. These figures are of immense import to our farming community, they suggest again that our cow testing members might well add to their co-operative purchases of feed stuffs the further co-operation of the very best pure bred sire to be found.

SOME SAMPLE INCREASES IN 3 YEARS COW TESTING, BOTH IN NUMBER OF COWS AND YIELDS OF MILK.

	Last Year.		3 Years Ago.		INCREASE PER COW	PERCENTAGE INCREASE	
Herd	No. of Cows	Average Lb. Milk	No. of Cows	Average Lb. Milk	Lb. Milk	Lb. Milk	No. of Cows
A	9	7,225	5	6,287	938	14%	80%
B	14	7,574	8	5,894	1,680	28	75
C	8	6,404	5	4,704	1,700	36	60
D	11	7,255	8	5,266	1,989	38	37
E	7	4,844	2	2,811	2,033	72	350
F	16	7,259	12	4,572	2,687	58	33
G	8	10,935	5	7,689	3,246	42	60
Average	73	7,392	45	5,405	1,987	36	62

TOTAL YIELDS 296,459 lbs. Milk MORE. 122% INCREASE.

After three years of application of this simple tally system, cow testing, we see these herds increasing in the yield of milk per cow from 2,800 lbs. to 4,800 lbs., from 4,500 to 7,200, from 7,600 to 10,900 lbs. Here are gains of from 14 to 72%.

As these figures show, the general average increase is 1,987 lbs. of milk per cow, or 36 per cent: while in place of 45 cows these men now own 73, or 62 per cent more. So much better is the general average of the cows kept that the total milk yield is increased by 296,459 pounds, one hundred and twenty-two per cent.

These seven or eight points hastily sketched indicate clearly that cow testing is not simply a mere matter of occasionally sharpening a lead pencil to puncture the toy balloon of a few low average yields; the outlook is far broader, higher ambitions are fostered.

If we all grip these wider problems of advanced dairying with intensity and tenacity, we shall with loyal and useful service to country and generation work a revolution through cow testing possibilities.

THE FEEDING OF BACON-PIGS

THE large slaughter-houses frequently complain about pigs bought in the province of Quebec, and say that they are forced to buy in Ontario in order to get suitable bacon-pigs for their trade. They contend that many of the pigs from the province of Quebec arrive at the abattoirs in very bad condition; they are old, thick-skinned and too lean, have a heavy carcass and dry muscles. It is impossible for the abattoirs to produce really first-class bacon from such meat, and the pigs give what is called *skinned* or inferior bacon.

If we enquire why so many inferior pigs are delivered to the abattoirs, some people may reply that the province of Quebec needs a better breed of pigs. So far as I can see, however, there are plenty of really good pigs in the province, and it should not be difficult to produce really first-class bacon-pigs. I have seen many well-built pigs here which are as good as the best pigs in the largest bacon-producing countries. I do not mean by this that no attention need be given to breeding suitable pigs in the future; this requires, and always will require, the greatest care.

To my mind, the complaints from the big abattoirs regarding the quality of the bacon-pigs should not be put down altogether to the breeding, but to the feeding of the pigs. Some farmers do not give much attention to feeding, and do not want to spend much money on the pigs. When they have no concentrated feed in the house they feed the pigs very poorly, sometimes barely sufficient to keep them alive. And what is the result? The pigs are not gaining weight but are getting lean. The farmer does not like to look at his own pigs; he gets tired of them, and sometimes sells them early and gets a poor price because they are too small and too lean. In other cases the farmer will perhaps buy up some concentrated feed, but it takes a long time to get the pigs into really good condition, and often they are sold before they are ready. In both cases it means that the slaughter-houses receive the pigs in poor shape, lean and thick-skinned.

It should be a general rule in feeding pigs that the gain must not be stopped; this always means loss. The feeding should be done regularly from the time the pigs are taken away from the sow until they are going to be killed. Well fed and well tended a good bacon-pig will reach a live weight of 180 to 220 lbs when 6 to 6½ months old. This is quick feeding, but not too quick, allowing the use of a mixed fodder, green crops in the summer and roots or ensilage in the winter.

It is a mistake, however, to expect the best results by using only green crops or roots and ensilage. The pig's digestion is not strong enough for a large amount of such fodder. The result will be a very slow gain and meat of poor quality. A bacon pig needs on an average 700-750 feed units from the time it leaves the sow to the time it is ready for killing, and the farmer should be satisfied if about one-fifth of these feed-units can be given as green crops, roots, etc. The remaining four-fifths will have to be given as concentrated feed and dairy offal. Without this the pigs will make very slow gain, and will give meat of very inferior quality.

A. HANSON

ANNUAL MEETINGS OF THE LOCAL WOOL GROWERS' AND SHEEP BREEDERS' ASSOCIATIONS

Co-operative Marketing of Lambs a new Feature of the Work.—Prices for Wool higher this Year than last.—Minister of Agriculture being petitioned in regard to further Legislation for the Protection of Sheep against Dogs

THE annual meetings of the local Wool Growers' and Sheep Breeders' Associations in Pontiac, Argenteuil, District of Beauharnois, District of Bedford, Richmond, Sherbrooke and Compton Counties were held during the first three weeks in February. With the exception of Pontiac County these Associations were organized during the spring of 1915. They now have a total membership of 975, and in 1915 sold co-operatively, according to grade, 104,192 lbs. of wool for $31,689.20 or an average price of 30.36 cts. per lb., making a net gain of from 20 to 30 percent to members.

These Associations were organized by the Animal Husbandry Department of Macdonald College and have been under the supervision of Mr. A. A. MacMillan. The large attendance at the annual meetings was a strong evidence of the way in which co-operation is being received by the farmers of Quebec.

After the election of officers for the coming year, the meetings were thrown open for the discussion of other business.

The Grading and Sale of Wool

In all the Associations the board of directors was enlarged in order that the ground might be more thoroughly covered and that more members might be added during the coming season. Little or no change was made as to time of grading. In some Associations an additional grading centre was added to meet the needs of outlying members. In Pontiac and Argenteuil counties the executive committee was authorized to sign bonds for the purpose of raising money to transact the business of the Association. This will give the Association a much better standing with the banks and will greatly facilitate the work of the Secretary-Treasurer. It is hoped that the other Associations will adopt this measure as well. It was the unanimous opinion of members that the wool should be sold as soon as graded and full charge of sales was left in the hands of the executive committee or a special sales committee appointed for that purpose. The membership fee for handling the wool was set at three to four cents per fleece. Wool sacks and paper are to be placed in the hands of the directors, where they may be obtained by the members.

Co-operative Marketing of Lambs

In addition to the co-operative sale of wool, the Associations are undertaking the co-operative marketing of lambs. It is the intention to sell direct to the packing houses for cash F.O.B. at shipping points. Two sales have been arranged at such dates as will best meet the requirements of each Association. Buyers will be notified in advance of these sales and bids will be received either personnally, by letter or by telephone, the lambs being sold to the highest bidder.

Members will be kept posted as to market prices either through the local papers or by posters. Parties selling in this way will know that they will receive full market value for their lambs on the particular date on which they choose to sell. The membership fee for selling the lambs in this way has been set at five to ten cents each. The Associations are impressing upon members the advisability of docking and castrating in order that the lambs may be held for sale at any time. It is pointed out that during the last two years lambs have been higher in price towards the end of the season so that those who are in a position to hold have a heavier lamb selling for a higher price per pound. Lambs will be graded and sold according to weight and quality.

Further Protection for Sheep Against Dogs

Further protection for sheep against dogs was a live topic at each meeting. Repeated evidence of the ravages of the depredating dog was brought forward. Not only were resolutions passed asking the Honorable Minister of Agriculture for further legislation for the protection of sheep against dogs, but in some cases petitions are being signed by the members which will be forwarded to the Provincial Members of Parliament and to the Honorable Minister of Agriculture for consideration. There has been great difficulty in passing the present provision for law by petitions in municipalities. There are between twenty and thirty municipalities in certain counties in the Province of Quebec, so that even if the present law were revised so that twenty-five ratepayers would be sufficient to enforce it in a municipality, the fact that twenty to thirty petitions are necessary to make such a law county-wide is a serious objection and the Association feel that while nothing short of a provincial law will fully cover the sheep interests, if there are serious objections to passing a provincial law there should be no objection to making provision for a county law provided a petition signed by not more than one hundred names was presented to the county council. The Associations were unanimous in adopting the recommendations "re act for the protection of sheep against dogs" as outlined by the Animal Husbandry Department of Macdonald College.

Educational Features

Mr. A. A. MacMillan, who attended the annual meetings, expressed extreme satisfaction with the progress that had been made during the past year, but emphasized the fact that prospects were even brighter for the coming year. The best grades of wool are now selling on the Boston Market for 38 to 40 cts. per pound, and lambs are likely to be a record price next fall. A great deal of educational work had already been done in demonstrating the proper methods of preparing wool for market. Further work along this line would be done in the outlying sections and in addition, the docking and castrating of lambs would be strongly featured. Co-operative dipping is another feature of the work that has as yet been scarcely touched. It is hoped that each Association will do something along this line next summer.

An effort will be made to extend the local sales policy so that all members will have an opportunity to select and purchase purebred breeding stock of quality and breeding at a reasonable price.

The scarcity of farm labor and the remunerative prices for sheep products have had much to do with the present tendency on the part of farmers to reinstate the sheep on their farms. Quebec needs more sheep and there is yet much to be done in the way of flock improvement.

THE DAIRY

CLASSIFICATION OF AGRICULTURAL PRODUCTS IN THE PROVINCE OF QUEBEC

At the annual convention of the Canadian Produce Association held at Belleville on February 8th and 9th the question of establishing a uniform classification for all agricultural products was discussed. Reference was made to a certain number of butter-makers in the provinces of Alberta, Saskatchewan and Manitoba who for the last two years have put on the market a certain quantity of classified butter.

This system of classification of produce and of sale according to quality is still in its infant stage in the Western provinces, and is absolutely unknown in Ontario, but for the past six years it has been in operation in Quebec, under the auspices of the Co-operative Agricultural Cheesemakers' Society of Quebec, aided by the provincial Minister of Agriculture. It was in this province that the impartial classification of agricultural products by experts and their sale after this classification had its origin; we are pleased to be able to make this statement, and recall the inauguration of this system with pride.

The attached table will give some idea of the work accomplished in this connection during the last six years, and of the excellent results obtained.

The classification is made at the depots of the Co-operative Agricultural Cheesemakers' Society of Quebec by experts assigned by the provincial Minister of Agriculture. These experts note carefully the defects of each product on a certificate of classification which is sent to the producer; a second copy of this certificate is furnished to the buyer. Aided by the remarks made by the expert classifier the producer is able to improve the quality of his goods for market. After the products have been classified according to quality, a sale is made and the price obtained is paid over to the producer.

The experience of the past six years enables us to say that this system has shown its efficiency in the province of Quebec, and we do not hesitate to say that it is the only way of obtaining agricultural products of superior quality. The farmers of the province understand this, as can be easily seen by the large quantity of produce sold each year under the auspices of the Co-operative Society of Cheesemakers.

We hope that this system of classification and sale will soon become general throughout the country as it would without doubt be to the advantage of the agricultural community.

AUGUSTE TRUDEL,

Agent of the Co-operative
Society of Quebec Cheesemakers.

MILK

The Problem and its Solution

(Continued from February issue)

In the last issue of the Journal it was stated that so far as the chemical purity of milk is concerned, the purchaser is comparatively well safeguarded when municipal control of the milk supply is pursued at all. Further, the statement was made that it is the biological, or to be more specific, the bacteriological constitution of the milk which at the present time is a matter of the gravest concern. We know that the bacterial content of the milk is largely under control, but in the January issue the opinion was expressed that such control will only be successful when exercised by all those concerned with the problem of the milk supply.

But how can the producer, the distributor and the consumer of milk by concerted action bring about a more efficient control of the bacterial life present in the milk? The prime essential is a judicious and systematic educational campaign. Such a campaign should not be merely of a technical nature but should undertake also to engender within the minds of the three factors concerned—farmer, distributor, and consumer — an appreciation of the difficulties and responsibilities of each other factor. It should be conducted in such a manner that the producer will plainly see the particular part he has to play; that the distributor will realize that he is the guardian of the bacterial quality of the milk once it has reached his hands; and that the consumer will appreciate the fact that it is incumbent upon him to cease crying for the moon, and as Kipling says realize that *for all we get we pay.* The farmers, when it is a question of production of milk for city consumption are at present left almost entirely to their own resources. They are disorganized and an utter lack of co-operative effort is manifest. There are Associations of milk producers in this province but they are such in name rather than in spirit. Their manner of co-operation is not even based upon the first law of nature — the law of self-preservation. The reason is not abstruse, but the necessity for a spirited movement is urgent. The production of milk for consumption has assumed large proportions in a comparatively short time and no effective machinery on the part of the farmers has been put into operation to deal with new situations as they arise. Apart from those who are naturally progressive, and apart from those who have attended courses at one of the various agricultural colleges and institutions, the number of milk producers who have even a waking knowledge of the requirements of the law or of that which is desirable from the public health point of view is very small.

The large majority of the farmers engaged in producing milk is dependent upon the inspectors of the city health departments for a considerable amount of the information they receive respecting the conditions associated with the shipping of milk for consumption. Much of the information is valuable but of necessity it savours of the "verboten" of the Germans and consists to a great extent of "Thou shalt not!" As to the technical accomplishments of the inspectors sent out by the cities something shall be said later; but inspection is necessary and supremely so. At the same time it is a most humiliating position for the farmer to enjoy—if enjoy it he does. The inspector is working at a disadvantage because it is always difficult to beget enthusiasm by means of threats. The farmer is at a disadvantage because he has no representative authority behind him. He can appeal to the college for advice; and can, if a college demonstrator be available, have such advice at his own door for the asking. But the demonstrators are few in number and the Colleges, like Jerusalem, are not always acessible at short notice. The solution of the milk problem is of necessity to a great extent a matter of dollars and cents. What means has the farmer of insisting upon a remunerative price from the city milk dealer? None whatever. What means has he of obtaining information upon the conditions of the milk market, the current prices and the outlook for the immediate future? Small means indeed. What power has he by which he can successfully approach the railway companies for greater or more convenient transportation facilities? The Railway Commission is a court of appeal for the farmer, but the strength of the appeal is weakened by the fact that too often it is not the appeal of an organized body of farmers.

With rare exceptions each man has to depend upon himself. Such business isolation is passing away in almost every phase of industry, but the milk producing farmer still continues to deny himself the advantages of concerted action. It is in one sense possibly a commendable independency, but in nearly every other sense disastrous. Associations for dealing with wool are already in existence, and are admittedly doing a splendid work. In some districts in this province there is an even greater necessity for the formation of responsible associations of milk producers. Such would of course be established and conducted in an entirely different manner than that pertaining to associations of any other nature. But the day of salvation for the milk producing farmer is going to continue to be in the dim and distant future until some movement in the direction of co-operation is made. One great difficulty experienced by many farmers who are dependent upon the sale of their milk as a means of livelihood is the expense and the amount of time entailed by driving some miles to a railway station. In some cases other farmers act as transporting agents. This means a reduced price for the original producers and with the railway freight charges in some cases is responsible for a difference of four cents per gallon between the price the farmer secures from his dealer and the gross returns he receives.

No amount of city inspection will remedy or palliate such conditions. But co-operation and associative methods adopted by the farmers themselves can, and if properly organized will, do both. Before this can be done information must be forthcoming as to the best means of bringing such about. And this is a part of the educational campaign for the initiation of which one would look to the colleges and their representatives.

(To be continued).

WILFRID SADLER,
Bacteriology Department,
Macdonald College

NEW POSSIBILITIES IN DAIRYING

II. The Making of "Clotted Cream"

An address given at the Eastern Ontario Dairymen's Convention, Renfrew, January 5th 1916

(Continued from February issue)

YOU have listened to a few observations on the question of cheese, and presently we will return to the subject. First, however, I wish to deal with the subject of *Clotted Cream*, Devonshire Clotted Cream. In clotted cream we have a delicacy and at the same time a product full of commercial possibilities, and pre-eminently suited to the palate of the epicurean diner. The butter fat in this form is well emulsified, and is easily digested. By the medical profession it is recommended as an excellent fatty food and is often prescribed as an alternative to cod liver oil.

Some few years ago I undertook for the English Board of Agriculture an investigation into the methods adopted by the makers of clotted cream, and subsequently conducted a series of experiments as a result of and based upon the enquiry pursued. Ever since coming to Canada I have been impressed with the great opportunities here existing for the establishment of a new industry, one I am sure which would be a sound financial undertaking for the dairyman, and one which would be welcomed by the consumer. In the Niagara peninsula, in the city of Ottawa, in Toronto and elsewhere, a constant supply of a first class clotted cream would, especially during the fruit season, rapidly create its own demand; would increase the interest of the consumer in the products of the dairy; and would be an industry returning an adequate profit to the farmer or dairyman who undertakes to pioneer and substantiate the production. In this country it would be quite feasible to prepare the cream on the farm, or at the creamery or factory. In the latter case the supply of steam which is already of necessity installed would simplify very considerably the initial expense entailed in equipment. In the main, the equipment consists of a long copper or galvanized tank, some three to four feet from the floor. This tank about 3 ft. wide and 1 foot deep is to accommodate water and is fitted with steam connections whereby the water may be heated. The tank is fitted with a cover hollowed in such a way as will admit of pans being supported and at the same time surrounded by the water. These pans used for the milk are preferably made of aluminum or block tin. They are 20-24 inches in diameter at the top, 12-14 inches diameter at the bottom and are 8 inches deep. It may be more convenient and economise steam if the tank used for the heating is subdivided in such a manner that each pan is in its own container. A cool room is required, fitted with latticed metal shelves. Small strainers resembling a culinary strainer, palette knives and perforated metal skimmers complete the essential apparatus. It will be seen that the whole of the equipment is such that a local tinsmith or hardware manufacturer, if competent, can install without much difficulty; and apart from the room set aside for cooling purposes, the amount of floor space required is not large. Having the necessary equipment, the prime essential as in all dairy processes, if success is to be insured, is a bacteriologically clean milk. The milk on being received is poured into the pans, using for each pan from 6 to 8 quarts. The pans are set aside in the cool room and left for 10-12 hours for the cream to rise. When operations are to begin the steam is turned on and the water in the tank heated to a temperature of about 200°F. The pans of milk are placed in the tank, the greatest care being observed in order that the layer of cream shall not be disturbed. The steam heating continues, and the contents of the pans reach a temperature of 180-190°F.; this operation usually taking about 20-30 minutes. When the heating or 'scalding" is completed, the layer of cream in the pan is crinkled, and appears as a blanket or "head" of cream on the surface of the milk, from ¼ to ½ inch thick. The pans are now removed, placed on the shelves in the cooling room and allowed to remain for 20-24 hours. We now have the "clotted cream". It is lifted with the skimmer and placed in the perforated strainer. This part of the proceeding calls for considerable skill, for excessive stirring and mixing of the cream is liable to destroy the texture—a highly important consideration. The cream is ready for sale at once, and for marketing purposes is packed into small earthenware jars or wood pulp cups similar to those in vogue as receptacles for cream. Clotted cream is sold by the pound, and when produced under good conditions can be perfectly sweet and typical after at least 48 hours in transit, using no preservative whatever. This does not represent the actual length of time during which the cream may be kept. It represents the length of time when at a temperature such as mail and express packets are subject to when carried by rail.

I have found in using Shorthorn milk that the average weight obtained from many trials was 10.39 ozs. of clotted cream from 15 lbs of milk; or 1 lb. of clotted cream from 23 lbs. of milk. The price at which the cream finds market varies, but in general one might say that it compares favourably with the price obtainable for whole milk shipped to the city for consumption. In addition to this, the scald milk — the residual milk after the cream has been lifted—is a product of considerable food value and may with advantage be used for human consumption; where this is done, a price is often obtained equivalent to from one half to two thirds the prevailing price for whole milk. For cooking purposes this scald milk is desirable for the amount of butterfat present is frequently as high as 1%. In the experiments to which I have referred an average butterfat content of ¾ of one per cent (0.75%) was found. Further, the process involved in the preparation of the cream serves to pasteurise both the cream and the residual milk, and this ensures the latter being a perfectly safe as well as an excellent food for the rearing of young calves. The unique flavour of clotted cream is no doubt due in some degree to the scalding process; but I have reason for believing that both the flavour and the keeping properties of the cream are largely problems of a bacteriological nature. In the work with which I am dealing the average percentage of butter fat in the cream was 62.6; 50% higher than the average in rich raw cream. Regarding the qualities required in a typical sample of clotted cream, it must be granular in texture, firmer than the thickest of cream obtained from the separator but not so firm as a freshly made cream cheese; the colour should be golden. Too much moisture indicates an excess of scald milk incorporated and a consequent impairing of the keeping qualities. The cream must have a co-called "nutty" taste and be decidedly pleasing to the palate.

Many adaptations of the method to meet local conditions may be suggested and will suggest themselves.

WILFRID SADLER

(To be continued).

TO A CANADIAN LAD KILLED IN THE WAR

Duncan Campbell Scott, in University Magazine.

O noble youth that held our honor in keeping,
And bore it sacred through the battle flame,
How shall we give full measure of acclaim
To thy sharp labor, thy immortal reaping?
For though we sowed with doubtful hands, half sleeping,
Thou in thy vivid pride hast reaped a nation,
And brought it in with shouts and exultation,
With drums and trumpets, with flags flashing and leaping.
Let us bring pungent wreaths of balsam, and tender
Tendrils of wild-flowers, lovelier for thy daring,
And deck a sylvan shrine, where the maple parts
The moonlight, with lilac bloom, and the splendor
Of suns unwearied: all unwithered, wearing
Thy valor stainless in our heart of hearts.

The Sunday-school teacher put to her class a number of questions touching the history of the cities mentioned in the Bible.

"What happened to Babylon?" was the first query.

"It fell," said one boy.

"And what became of Nineveh"?

"It was destroyed".

"And what of Tyre"?

"Punctured"!

A country school-teacher was cashing her monthly check at the bank. The teller apologized for the filthy condition of the bills, saying: "I hope you are not afraid of microbes".

"Not a bit", answered the school-ma'am; "I'm sure no microbe could live on my salary".

CO-OPERATIVE AGRICULTURAL SOCIETY OF CHEESEMAKERS OF QUEBEC

Report of Operations for the Season 1915

Montreal, January 5th 1916.

Sir,

YOU will find attached the annual report of the operations of the Co-operative Agricultural Society of Quebec Cheesemakers. This report contains tables giving the prices obtained for the various products according to their quality; it also gives the quantity, total and according to class, of the products sold. From comparisons that we have made we are able to state that our prices for butter and cheese will compare favorably with those of any other market in the province, and with that of Brockville, Ontario.

I would particularly draw the attention of members to the prices obtained for products of first quality. A simple comparison with the prices obtained for other qualities will enable them to realize the greater profits which could be obtained by sending to the Society only products of the finest quality. This is easy to judge by observing the large quantity of strictly first class products received in 1915, as indicated in the report.

Patrons of butter and cheese factories should stipulate that their butter and cheese be sold through the agency of the Co-operative Agricultural Cheesemakers' Society of Quebec; they should also send their other products either directly or through the medium of the local co-operative societies. By this means the prices obtained would be higher and the quantity of produce offered for sale would be greater.

We count on the co-operative of everyone for the year 1916.

A. TRUDEL,
Manager

STATEMENT OF PRODUCTS OF EACH QUALITY SOLD BY OUR AGENCY SINCE ITS EXISTENCE

Year 1910:	No. 1	No. 2	No. 3	Pasteurised	TOTAL	VALUE
Cheese	20,746 boxes	14,610 boxes	4,279 boxes		39,635 boxes	$ 361,938.00
Year 1911:						
Cheese	19,779 boxes	36,449 boxes	22,519 boxes		78,797 boxes	1,001,750.83
Butter	6,989 "	6,251 "	617 "	327 boxes	14,184 "	
Year 1912:						
Cheese	23,976 boxes	39,026 boxes	26,486 boxes		89,488 boxes	1,358,026.11
Butter	13,053 "	9,316 "	1,883 "	2,785 boxes	27,037 boxes	
Year 1913:						
Cheese	23,436 boxes	35,276 boxes	17,933 boxes		76,645 boxes	1,351,412.63
Butter	19,250 "	13,478 "	1,076 "	5,806 boxes	39,610 "	
Year 1914:						
Butter	24,277 "	8,659 "		6,742 boxes	39,678 "	1,702,580.37
Cheese	32,064 boxes	43,052 boxes	23,015 boxes		98,131 boxes	
Fresh Eggs	253 " of 30 doz. — 126 boxes of 30 doz. No. 1				382 "	
Poultry	9,873 pounds	6,186 pounds	5,574 pounds		21,633 pounds	
Year 1915:						
Cheese	42,400 boxes	43,139 boxes	22,440 boxes		107,979 boxes	2,077,564.96
Butter	27,883 "	9,241 "	1,125 "	9,321 boxes	47,570 "	
Fresh Eggs	1,623 " of 30 doz. — 830 boxes of 30 doz.				2,453 "	
Poultry	18,230 pounds	24,829 pounds	19,518 pounds		62,577 pounds	
Maple Syrup	261 gallons	1,479 gallons	501 gallons		2,241 gal.	
Maple Sugar	798 pounds	9,698 pounds	2,673 pounds		13,169 pounds	

TOTAL BUTTER AND CHEESE OF EACH QUALITY FROM 1910 TO 1915.

	No. 1	No. 2	No. 3	Pasteurised	Grand total.
Cheese	162,401 boxes	211,602 boxes	116,672 boxes		490,675 boxes.
Butter	91,452 "	46,945 "	4,701 "	24,981 boxes	168,079 "

Total Value from 1910-1915 : $7,853,272.90

(Lack of space prevents printing all the Tables of Mr. Trudel's Report. We note that the prices paid for Quality No. 1 Cheese for the season averaged about ¼ cent per lb. higher than for Quality No. 2, and about ½ cent higher than Quality No. 3. The prices paid for Pasteurised butter averaged ¼ cent higher than for Quality No. 1, and about 1 cent higher than Quality No. 2.—*Editor.*)

THE ADVENTURER

He did not come in the red dawn,
He did not come at noon,
And all the long, bright highway
Lay lonely to the moon.

And never more, we know now,
Will he come wandering down
The breezy hollows of the hills
Into the quiet town.

For he has heard a voice cry
A starry-faint "Ahoy!"
Far up the wind, and followed
Unquestioning after joy.

But we are long forgetting
The quiet way he went,
With looks of love and gentle scorn
So sweetly, subtly blent.

We can not cease to wonder,
We two who loved him, how
He fares along the windy ways
His feet must travel now.

But we must draw the curtain
And fasten bolt and bars,
And talk, here in the firelight,
Of him beneath the stars.

—Odell Shepard, in "The Bellman" (Minneapolis).

No one who reads at all widely the agricultural reports from the countries abroad can fail to be struck with the part women are taking in the redirection of country life. Women are regenerating the rural schools. They are carrying out agricultural experiments. They are giving a lead in the matter of co-operation in rural home and community industries. They are banding themselves together to raise the standard of living in the country. What is most important of all, they are increasing the efficiency of the rural home.

POULTRY

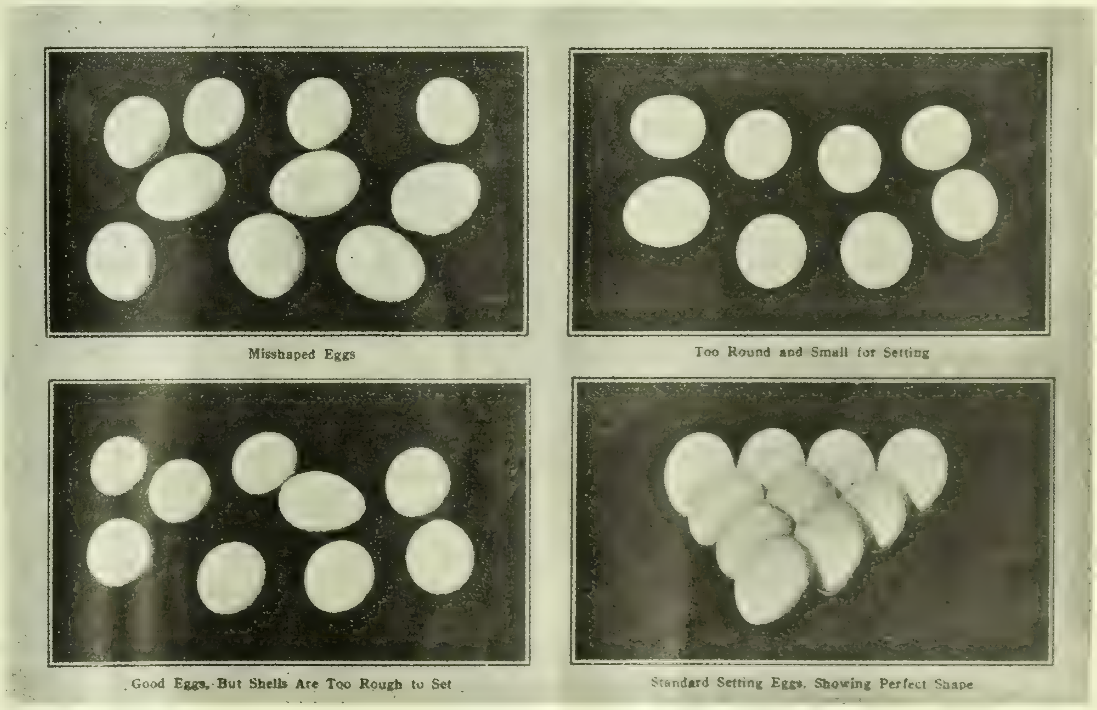
THE HATCHING OF CHICKS

EVERY farmer who hatches chicks under hens or in incubators should endeavour to secure as many chicks as possible from the eggs set. The number of strong, healthy chicks raised in proportion to the number of eggs set is the supreme test of the ability of the farmer as a poultry producer. Incubation and brooding are the foundation stones upon which the poultry industry is developed, and the egg is the chief factor in the reproduction of the flock. Only a fertile egg can develop into a chick. The condition or quality of the fertile egg, however, has much to do with the kind of chick into which it will develop.

The largest possible proportion of fertile eggs should be produced, and to accomplish this care must be exercised in the selection and mating of the breeding stock. The breeders must be healthy and vigorous, otherwise the fertility of the eggs is apt to be low and the chicks hatched will be weak. The best attention and care during the incubation of the eggs and brooding of the chicks will not make up for lack of vigour in the breeding stock.

Usually about ten females are mated to one male, and if the breeding flock can be kept in small flocks the fertility is better than when one hundred or more hens run together. Great care should be exercised in the selection of the male breeders; they should be well matured and thrifty, and should possess plenty of constitutional vigour.

A careful selection should be made of the eggs intended for hatching, whether they are to be put under hens or in incubators. Small eggs produce small chicks, and eggs uneven in shape are not suitable for incubation. Extremely long and very short round eggs should be discarded. The standard shape is oval, one end being somewhat larger than the other, and the standard weight


Misshaped Eggs

Too Round and Small for Setting

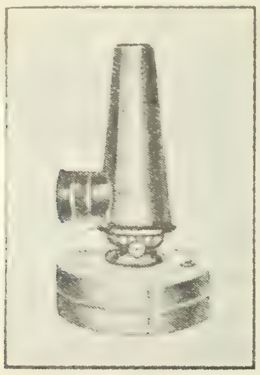
Good Eggs, But Shells Are Too Rough to Set

Standard Setting Eggs, Showing Perfect Shape

Bad and Good Types of eggs for Hatching. The lower right-hand picture shows the correct type.

of each egg is two ounces, or one dozen eggs to one and a half pounds.

Eggs for incubation should not be stored too long, for the longer they are kept the more they seem to lose in hatching power. It is wise not to store them longer than two weeks, during which time they should be kept in a temperature of 50° to 60°F., turning them occasionally.



An egg tester for testing eggs before and during incubation.

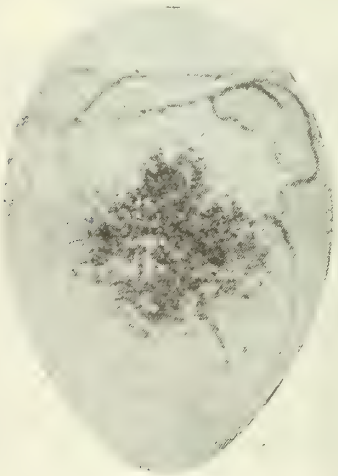
Local conditions will determine whether the eggs should be hatched in incubators or under hens; some farmers have better success with the natural and some with the artificial method. Where two or three hundred chicks are to be raised annually it will usually be found that a good incubator is a profitable investment. On many farms, however, about 100 chickens are raised annually, and in such cases they can well be raised with hens.

The Natural Method

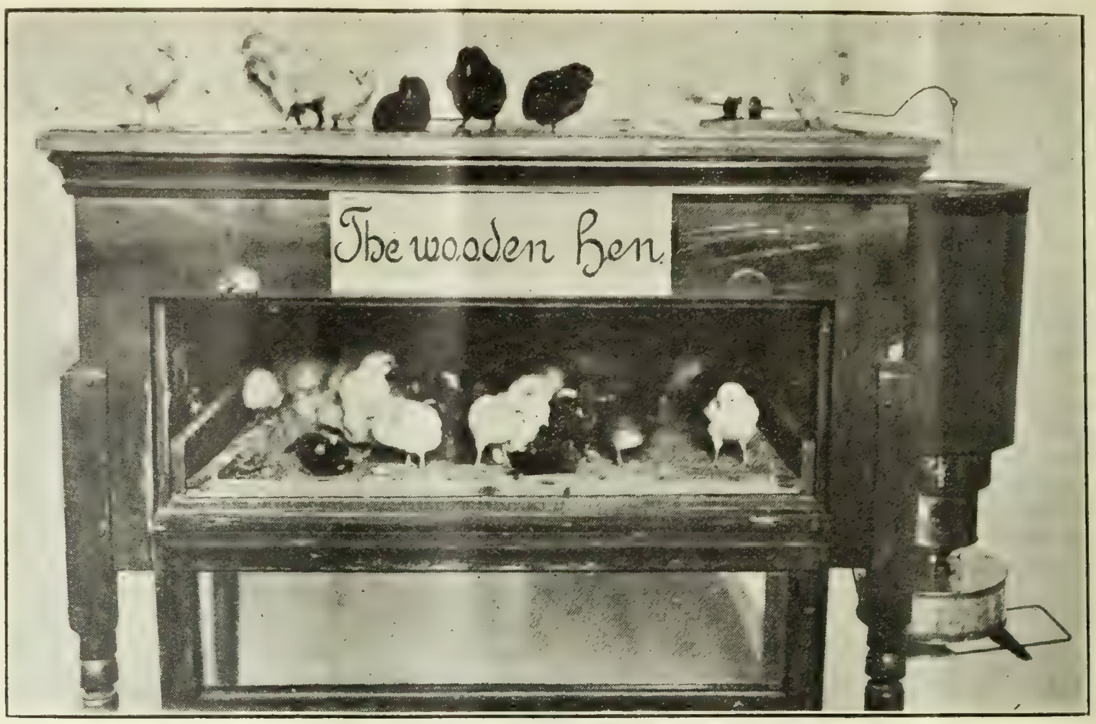
The ability of the hen to hatch and rear a healthy brood of chicks is apparent when she steals away and in due time returns with her brood, which she raises with little or no loss. In natural incubation it is necessary to have good brooding hens, properly constructed nests and to give careful attention during the incubation period. The hen should have the brooding instinct well developed. She should be of medium size, large enough to cover fifteen eggs. It will be found that Plymouth Rocks, Rhode Island Reds, and Wyandottes are among the best brooders.

The nest should be carefully built with fine soft hay, straw or leaves, and be of such shape that the hen will fill it nicely, affording complete protection for a single layer of eggs. The nest should be placed in such a position that the hen will not have to fly or jump into it, otherwise broken eggs will result. A box about eighteen inches square and about eight inches high makes a good nest. A sod of grass turned upside down in the bottom of the box will keep the nest moist and help the hatch.

It will be found convenient to set a number of hens at the same time, so that they may be cared for together, and it is wise to have the nests covered so that each hen can be confined to her own nest. The room should be secluded, fairly light and cool. The best time to set the hens is after dark and they should be allowed to sit for a day or so on nest eggs before being given the hatching eggs.



A fertile egg on the seventh day of incubation. Note the blood vessels extending from the developing chick into the white of the egg.



Showing chicks with the incubator in which they were hatched.

It is very necessary to dust the hens thoroughly with lice powder at the time of setting. To do this take the hen by the feet, holding the head downward, and sprinkle the powder well into the feathers, rubbing it around the joints. Dust again before hatching time, for only in this way can the chicks be insured against lice and mites.

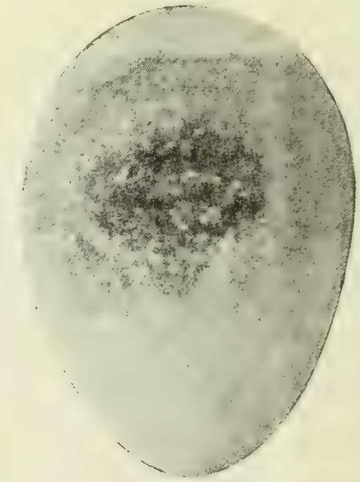
The food for the hens should consist of hard grains, such as wheat, corn, oats or a mixture of these. Green food should be given occasionally and grit and clean water should be always accessible. Where a number of hens are sitting in the same room it will be found convenient to let them feed together, making sure that each nest is properly covered after feeding time.

The Artificial Method

In hatching eggs by the artificial method it is very necessary to use a good incubator, and it cannot be too strongly urged that the better classes of incubators are the best investment. The incubator must be given a good location, such as a cellar or a clean room where the temperature is stable. It should be well ventilated but free from draughts.

Success in incubation depends upon the method of operation and the directions of the makers should be followed, especially by amateurs. As experience in incubation is gained the directions may be varied to suit local conditions. In all cases the incubator should be started a few days before the eggs are to be placed in it, in order that an even temperature may be maintained by proper regulation of the heat. The registered temperature on a level with the eggs as they lie on the egg tray should be 103°. The condition of the lamp flame has much to do in controlling the temperature, for if the wick is not trimmed properly smoking is liable to result, which will affect the temperature. The lamp requires to be filled with oil every morning, and the wick should be trimmed so that it will give a broad even flame with nicely rounded corners. The proper method of trimming the wick is to rub off the charred portion with the fingers, rounding off the corners. When a new wick is to be used the rough edges should be burned off by holding it in the flame of a lighted match. The lamp should be attended to after the eggs are turned and aired in the morning.

Turning the eggs twice a day is necessary and this should be started on the third day and continue until about the eighteenth day. In turning, a few eggs at the front of the tray are removed and the remainder rolled forward, those taken off being placed at the back of the tray. The airing of the eggs is done at the time of turning, and the amount of airing necessary depends to some extent on the season of the year. The eggs are usually allowed to remain on the top of the incubator for about five or ten minutes in the morning and evening. During airing the incubator door should be kept closed. The majority of incubators have ventilating devices; the ventilators should be kept closed during the first week, partially opened during the second, and opened fully during the last week of the incubation period.



An infertile egg on the seventh day of incubation. No development has taken place.

It has been found a good practice in artificial incubation to supply moisture in order to prevent the eggs drying up too rapidly, for eggs lose much more moisture when in incubators than when under hens. It seems best to supply moisture from the beginning of the hatch; this can be done by placing a shallow pan or dish of water in the bottom of the egg chamber.

A test should be made on the seventh day to detect infertile eggs, and all clear eggs should be removed. Testing should also be done on the fifteenth day to remove all dead chicks.

If proper conditions have been maintained throughout the three weeks' incubation the chicks should commence to hatch on the twentieth and be all hatched by the twenty-first day. While the chicks are hatching it is wise to keep the incubator chamber dark, as this tends to keep them quiet. They should not be removed until several hours after the last chick has hatched.

The incubator should be thoroughly disinfected with a ten per cent solution of a good disinfectant before and after each hatch.

M. A. JULL

EGGS TO THE FRONT

The Fourth Annual Convention of the Canadian Produce Association Held at Belleville, Ont., February 8th and 9th, 1916

THE necessity for the developing of the Export Trade along broad national lines was the chief topic discussed at the fourth annual convention of the Canadian Produce Association held in Belleville on the eighth and ninth of February.

About two hundred representatives of the leading produce houses in Eastern Canada attended the convention. Delegates were also present from the Western as well as the Maritime Provinces.

A cordial welcome was extended to the visitors by Mayor Ketcheson and President Elliot of the Board of Trade. In his reply, the president of the Association, Mr. R. J. McLean of Toronto, sounded the key note of the present trade situation when he declared that Great Britain in the present emergency required all the eggs, poultry, and butter that Canada can send, and further that nothing should be neglected that will serve to establish a natural reputation for the Canadian product in the Old Land.

The year 1915 was the banner year for Canadian exports in eggs, both as regards quantity and prices. Four years before, prior to the organization of the Association, the quality of eggs received on the markets had been very variable, since the adoption of loss-off buying the quality had greatly improved. Supplies come forward much more quickly and in better condition. The transportation companies also were handling eggs more expeditiously.

The president pointed out that there was great need of increased production. The present surplus was wholly inadequate to meet the demand. No other department of the farm yielded such dividends as the poultry business. In order to encourage production the industry should be protected and the export trade supervised. It will not do for eggs of inferior quality to go forward and steps should be taken to mark all eggs intended for export with the name of the country of origin.

The testimony of the wholesale dealers in favor of "loss-off" buying resulted in a spirited discussion of the subject by the local and country buyers present. Several declared the system impracticable, that it did not reach the farmer. Others, who had followed it consistently claimed it did and that a marked improvement in quality had resulted. Mr. Sprague, Belleville, had adhered strictly to the system. Following previous action of the Association he felt it was his duty to do so or quit. Mr. McNabb, Dungannon, suggested that it would be a good plan if local associations were formed where buyers and others could get together periodically and settle their greivances. This idea was endorsed by the meeting.

Mr. A. S. Duclos, Edmonton, President of the Alberta Produce Association stated that his association had adopted the Standards for Eggs decided upon at the previous convention of the Canadian Produce Association and explained the system of quality payment, followed as a result. He gave statistics showing the remarkable increase in the production of eggs, butter and cheese in Alberta, "Let our watchword for 1916," said he, "BE MORE FARM PRODUCTS FOR THE MOTHER LAND". Mr. Duclos read a resolution recently passed by the Alberta Produce Association pointing out the fact that Canada now had a surplus of eggs, that prices to producers in future would be governed largely by the price at which the export product could be sold and the fact that both local and inter-provincial trade had suffered from lack of legal standards for trading, and calling upon the Minister of Agriculture to secure suitable legislation based upon the scheme of standardization already adopted by the Canadian Produce Association, and a system of inspection that will ensure that eggs intended for consumption in Canada and for export will be of such uniform grade and quality as will command the highest possible prices in the markets of the world. Reference was also made to the need of legislation providing for the regular and systematic inspection from a sanitary standpoint of all warehouses, shops and places in which eggs, butter and poultry are handled.

Mr. R. H. Gray, Montreal, read a paper on the subject of quality payment for eggs and the need of a uniform system of inspection. He pointed out that the wholesale dealer had an important function to perform in educating the farmer to produce goods of high quality, that the "loss-off" system of purchasing was alright in so far as it went, but that the dealer would not be exerting his influence for good to the full until such time as he was prepared to purchase goods on a quality basis, that there was little inducement for the producer to take the pains to produce a high grade article unless he was reasonably sure of being compensated for his trouble.

"Production and Thrift" was the subject of the address delivered by Dr. C. C. James, Special Commissioner of Agriculture for Canada at the banquet held on Tuesday evening. Dr. James stated that the calling of an additional 250,000 men for service overseas had placed new responsibility on Canada. National economy and greatly increased production of all farm products will be required if Canada, a country with a population of eight millions is going to finance and keep in the field an army of half a million men. The boys who go to the front and fight for us are entitled to the best that Canada can produce. Canada has also a duty to perform in supplying the mother land. Particular attention must be paid to home consumption. All unnecessary imports must be curtailed. Exports must be increased. Canadians do not know what thrift is, they have got to learn. Great Britain is thinking about legislating against luxuries. Dr. James appealed to the distributors to do their utmost. While the filling of war orders is a matter of necessity we ought to keep in mind that the output of our farms in the shape of food is ten times as great as the value of the output of war munitions. If Canada is to prosper, her citizens must not only increase production but also be more economical.

EXPORTATION OF EGGS AND POULTRY AND THE REQUIREMENTS OF THE BRITISH MARKET AFTER THE WAR.

This subject was introduced by Mr. Atherton of the Wm. Davies Co., Toronto, who said that if Canadian eggs are to occupy their proper place on the British market, it is essential that the quality of the product going forward be of the very best. Under ordinary conditions Canadian eggs would have met with very strong competition. Had conditions been normal last year it is a question whether our eggs would have been wanted at all after the condition in which they arrived during the fall of 1914. If the Canadian trade can gain the confidence of the importers there is no reason why the export business should not continue after the war. The war is giving Canada an excellent opportunity to become established on the British Market.

Mr. Silverwood of Silverwoods Ltd. London speaking on the export of poultry said that very little had been going to the British market owing to the lack of transportation facilities. Last year, however, a million and a half pounds had been shipped to the American market. This had resulted in much higher prices in Ontario than previously.

Mr. H. S. Arkell of the Live Stock Branch, Ottawa, who had just returned from a visit of investigation to the British market also spoke at some length on the possibilities of the export trade. He declared that the poultry business of Canada must find its place in the business of war. Canada must mobilize and organize every industry and every source of supply. After the war the export trade in agricultural products will help to stabilize credit and industry.

The American egg has not been received on the British market with as much favor as the Canadian egg. The latter has arrived in better condition.

It is most important that Canadian eggs should go forward as Canadian. In London, Liverpool, Manchester and Glasgow one sees Danish butter, Irish eggs, Canadian cheese etc. These are recognized as standard national products. The same result should be aimed at in regard to Canadian eggs. Canada can build a trade now on the reputation that has been created by Canadian soldiers.

EXPORTATION OF EGGS AND POULTRY AND THE REQUIREMENTS OF THE BRITISH MARKET AFTER THE WAR

MR. J. W. Atherton's address at the Annual Meeting of the Canadian Produce Association was a very timely one. It is impossible to give it at length, but following are some of the important points with reference to the exportation of eggs and poultry:—

(1) *Cases.* Many complaints were received during the fall of 1914 due to the use of frail cases. This year since the trade have adopted a heavier case similar to the road case very few complaints have been received. Some of the larger importers still maintain that the Danish and Russian, especially Russian, are more suitable for their market.

(2) *Stencilling.* Some importers would rather not have the name of the shipper on the case. They prefer to sell under their own brand. The retail trade, however, favors stencilling, regarding it as a guarantee of quality.

(3) *Ventilation.* It has been suggested that all cases be pierced with holes to allow ventilation or else leave a small space between the slats on either side of the case.

(4) *Defrosting and Grading.* Eggs should be thoroughly defrosted, preferably with dry air, before being repacked.

Mr. Atherton went on to say that the exports of eggs from Canada in 1915 were 259, 501 cases valued at $2,211,954. He concluded with the suggestion that it would be a good plan if two or three of the representative importers from England and Scotland could be invited to come to the next convention and discuss the requirements of the British market.

TWENTY LESSONS ON POULTRY

An Elementary Treatise prepared under the Direction of "The American Poultry Association", by C. T. Patterson, edited by Frank E. Hering; 55 illustrations, 92 pages, $.50 net. J. B. Lippincott Company, Publishers, Philadelphia

WE hope every farm home where there are children over nine and every school teacher whose work would give the least opportunity to use it will obtain this little book. It is the authoritative and official elementary poultry primer. Evidently the author and editor have studied the needs of young people. The pictures and the text present the facts concerning the different breeds and the best methods of mating, raising and caring for poultry in a lucid, simple manner, easily understood, stimulating and practical.

Its low price makes it available as a text book for rural schools. The type is large and clear, the illustrations excellently executed and the binding strong and durable.

There is an interesting appendix in which are suggestions for the organization and work of boys' and girls' poultry clubs, contests and fairs. The stimulating foreword, marking the book as standard, is signed by the American Poultry Association, represented by E. B. Thompson, President; S. T. Campbell, Secretary; C. T. Patterson, Author, and Frank E. Hering, Editor.

WOMAN'S WORLD

FOODS AND FOOD PREPARATION

Lesson XXIII

Starchy Desserts

Principles of Cooking

SINCE raw starch is not digestible, it is *most essential* that all starchy foods should be subjected to boiling water or dry heat and *thoroughly* cooked. Starch is not soluble in cold water, but is made soluble in boiling water and by long cooking is changed to dextrin, a still more easily digested form than soluble starch.

When foods which are almost pure starch, such as flour and corn starch, are to be cooked with a liquid *great* care must be taken to prevent the formation of *lumps* for these not only detract from the appearance of the food, but consist of an outer layer of soluble starch surrounding a centre of *unchanged* and *indigestible* material.

To avoid making lumps, therefore, the starch grains must be separated so that the hot liquid has a chance to act upon each one.

Separating the Starch Grains:

There are three different ways of separating the starch grains and avoiding lumps.

1. Flour.

(1). With sugar—Mix at least an equal measure of sugar with the flour and add to the heated liquid gradually.

(2). Melted Fat — Melt an equal measure of fat, add flour and stir until smooth. Remove from heat and stir in liquid.

(3). Cold Liquid—Mix an equal measure of cold liquid with the flour until very smooth. Stir in half this measure to thin it down, then add *gradually* the heated liquid.

2. Corn Starch and other starches.

The same methods are used except in the case of cold liquids when only an equal measure of cold liquid is needed.

Method of Thickening:

1. Separate starch grains.
2. Heat liquid and stir into separated grains.
3. Return to the top part of doule boiler and stir constantly until it thickens. Then cook with cover on from 15 to 20 minutes. (All puddings, sauces, etc. with a foundation liquid of milk should be cooked in a double boiler.)
3. Adding other ingredients.

(1) Whole eggs or egg yolk — Stir part of the thickened mixture into the beaten egg. Return all to the double boiler and cook a minute longer.

(2) Egg white.

(a) Folded in — Beat until stiff, add 2 tblsps. sugar reserved from pudding and beat as a meringue. Fold into slightly cooled pudding.

(b) Make a meringue for top of pudding.

(3) Chocolate — Melt chocolate and add it to the liquid as it is heated, *one tblsp.* sugar extra to every cup of liquid is needed with chocolate.

4. Caramel — Use 3 tblsps. of caramel to every cup of milk and omit sugar.

Individual mould of Cornstarch custard, served with jelly.

General Proportions

Cornstarch Pudding:

1 pt. milk
2 tblsp. cornstarch
1 teasp. vanilla
2—4 tblsp. (according to taste) sugar
½ teasp. salt.

Follow methods given above. When slightly cooled add flavoring and pour into dish or dishes in which it is to be served. Chill on ice. Serve with fresh berries and cream, or a custard sauce. This will make a loose mould.

Cornstarch Custards:

1 pt. milk
1 egg
½ teasp. salt
2½ tblsp. cornstarch
2 tblsp. sugar
1 teasp. vanilla.

Proceed as in the general rules. Cook corn starch ten minutes after it thickens, tightly covered. Beat egg slightly, and pour over it, stirring quickly, the starch mixture. Return all to double boiler, cook five minutes, stirring constantly. If cooled in individual moulds and kept in a cold place this custard will retain its shape when removed from the mould. Served with jelly, or homemade grape juice and cream, this makes an easily prepared as well as a nutritious and attractive dessert.

Cornstarch Pudding — Chocolate:

To the Cornstarch Pudding or Custard add 2 tblsp. chocolate. Grate it and mix with sugar.

Caramel Cornstarch Pudding, or Custard:

Add 3 tblsp. caramel to every cup of milk and omit sugar.

Lemon Pudding:

1 c. water.
3 tblsp. cornstarch
1 egg
1 c. sugar
1 lemon
1 tblsp. butter.

Pare lemon *thinly* and steep parings in boiling water. Mix cornstarch and sugar. Strain water off parings, stir it into cornstarch mixture and stir until it boils. Beat egg yolk and mix with lemon juice. Stir into it part of thickened mixture. Return to remaining pudding and stir one minute without boiling. Cool and fold in stiffly beaten white made into a meringue (for which 2 tblsp. sugar were reserved from pudding) or make a meringue for top of pudding. Bake in slow oven until lightly browned. (This makes two large, individual servings.)

Tapioca Custard:

1 pt. milk
1 teasp. butter
¼ c. sugar
1 to 2 eggs
½ c. tapioca or 3 tblsp. minute tapioca
1 teasp. vanilla
½ teasp. salt.

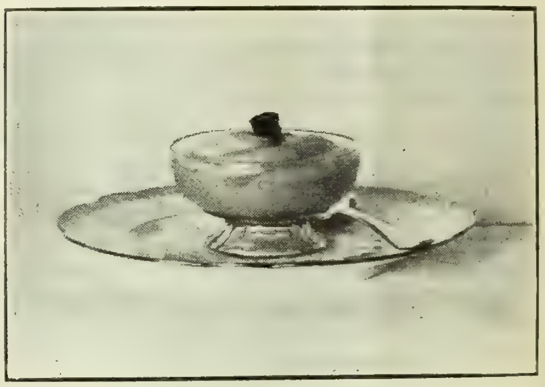
Soak tapioca one hour in cold water to cover. Add milk and cook in double boiler without stirring, until tapioca is transparent. Add sugar, salt and butter. Pour part of this on beaten egg yolks, return to double boiler and stir for one minute. Add flavoring. Cool and fold in stiffly beaten egg whites.

Apple Tapioca:

½ c. tapioca
½ c. sugar
1 teasp. butter
1 pt. water
1 teasp. vanilla
½ teasp. salt.
Tart apples.

Soak tapioca one hour in cold water to cover. Add 1 pt. water and cook until transparent. Add sugar, butter and flavoring. Prepare apples, arrange in buttered pudding dish or casserole, and sprinkle with powdered sugar. Pour over them the tapioca. Cover and bake in a moderate oven until apples are tender. Serve with sugar and cream.

Fruit Tapioca (or Sago):



Lemon Pudding with egg white folded in.

Substitute for the pt. water, sugar, apples and flavoring in above:—

1 pt. stewed or canned fruit.

A. L. Pattie in Practical Dietetics says, "For children, invalids and dyspeptics cornstarch puddings made with milk are admirable. They must, however, be *thoroughly cooked* that the *action of the heat may affect the starch*. The combination of starch and milk gives a wholesome, nutritive food, and the addition of egg increases the food value."

F. CAMPBELL

FARM AND CITY

A city man remarked to a farmer friend as follows:

"Tuesday we motored to the country club and golfed till dark, then trolleyed back and danced till morning."

The farmer "got back" in this language:

"I've been having some time myself. Wednesday I muled to the corn field and geehawed till sundown. Then I suppered till dark and piped till nine. Then I bedsteaded till five o'clock and breakfasted till it was time to go muling again."

OF GENERAL INTEREST

THE CHILDREN'S HOMER—II

Adventures of Odysseus—VI

THE Phaeacians helped Odysseus with many gifts, and he took a grateful farewell of their good king and queen, not forgetting the Princess Nausikaa.

As the ship in which the Phaeacian sailors were taking Odysseus to Ithaca drew near the shore, a strange deep sleep fell on him, and the sailors decided to put him on shore with the treasure they had given him, and leave him to look after himself.

When at length Odysseus awoke, he did not know where he was, but Athena, keeping watch over him, as always, came and told him about Penelope and the suitors, and how Telemachos had gone to Sparta to seek him. Athena advised him how to get the better of the suitors and helped him hide his Phaeacian treasure in a cave. Then, disguised by Athena as an old beggar, Odysseus sought shelter with Eumaios, his old swineherd, for, all alone as he was, he did not dare proclaim himself, lest the suitors should treacherously slay him.

Athena hastened to Telemachos and told him to return home. Menelaos and Helen gave him many farewell gifts, and he hurried away, reaching Ithaca in safety and landing secretly to escape the suitors. He went to the old swineherd, Eumaios, to learn from him what had happened in his absence, and sent him to tell his mother of his return. As soon as Eumaios was gone, Odysseus revealed himself to his son, and they two took counsel how they might get rid of the suitors.

Next morning Telemachos went early to the palace to see his mother, and a great load was lifted from Penelope's heart when she saw him; but he did not tell her yet of Odysseus's return. After a time, Eumaios and Odysseus, still disguised as a beggar, came to the palace. And as they came in, an old hound, Argos, lying by the portal, wagged his tail, and whined, and dropped his ears, for he knew Odysseus, yet was too old and feeble to rise and go to him. And tears came to Odysseus's eyes at sight of the brave old dog who knew his master, after so many years. Death came to Argos in that very hour.

Now Odysseus stood, a beggar in his own house, and begged of the suitors, and one of them struck and cursed him, refusing him food. A common beggar, too, who came often to the palace, was jealous of him, and tried to drive him out, and they fought, for the amusement of the suitors. Odysseus felled the beggar with one blow, which greatly pleased the suitors.

So the day went by, and Odysseus and Telemachos were hard put to it to bear the insolent and careless treatment of the suitors; yet they did. They even endured it in silence when one of the suitors struck Odysseus with his stool. In the evening, when at length the noisy visitors had gone, Penelope descended to the hall, having heard from Eumaios of the strange old beggar who could tell her news of her husband.

When Odysseus came before her, Penelope bade her old nurse wash the stranger's feet, and when she did so, the old woman knew him by a scar on his ankle, made when he was a child, by the tusk of a wild boar. She would have cried out, but Odysseus warned her not to betray him yet. He told Penelope many things that only an intimate friend could have known about Odysseus, and he said Odysseus would surely come home soon. Then Penelope told him of a dream she had had the night before, how an eagle had swooped down upon and slain the twenty white geese that she was wont to feed in her courtyard, and there had appeared one like a god, who said that the eagle was Odysseus and the geese were the suitors. She asked Odysseus to interpret the dream, but he said only that dreams were strange and hard to explain, yet she might be sure Odysseus would return within the year. Then Penelope bade the servants make a bed for the old man in the hall, and she retired to her chamber above.

When all was quiet, Odysseus pondered how he might slay the suitors, and it seemed to him that he heard Penelope weeping, far off in her chamber, and he prayed to Zeus to give a sign that all would go well on the morrow. Zeus thundered, for a sign, and a woman in the inner court, one of many who had been grinding at a mill all day, spoke, and prayed to Zeus. She was left alone, for the others, being stronger, had finished, and she prayed aloud that Zeus would punish the suitors, who forced her to work beyond her strength and weakened her knees with toil, that they might feast. "May they feast for the last time to-morrow", she said, and Odysseus was sure her words were a good omen for him.

Next day, when the suitors came, it occurred to Penelope to try them with a trick. She brought down the great bow of Odysseus, and said she would marry him who could bend it. All tried eargerly, but none could bend the great bow. Then Odysseus, who had told Eumaios and one other faithful servant who he was, asked to try the bow. But the suitors refused to let him; nevertheless, the swineherd took the bow and handed it to Odysseus, while the other faithful servant went and barred the outer doors of the court, as Odysseus had secretly bidden him, and told the old nurse to lock the women in their part of the house, and not to let them forth, no matter what sounds they heard in the great hall.

Thus, when all was ready, Odysseus strung the great bow with ease, and the suitors were terrified at the sight. Odysseus, with his first arrow, shot the most insolent suitor through the head, and then began a turmoil in the hall. Telemachos and the two faithful men went and got arms from an inner chamber, while still Odysseus had arrows enough to keep the suitors at a distance from him, but the suitors, looking about for weapons, found they had only their own swords, for Telemachos had removed all the other things from the walls of the court. There was a fierce fight, however, for Odysseus and his side were but four against many; yet they conquered in the end, and all the wicked suitors lay dead in the hall, just as Penelope had dreamed.

When the room had been cleansed of the signs of combat, the old nurse brought Penelope, but at first she could not believe that it was truly Odysseus, until he proved it, by telling her what only he could know, that the bed in the inner hall could not be moved unless it were hewn free with an axe, for Odysseus himself had built the chamber around the trunk of a great olive tree, and made the tree the head of the bed.

They rested for that night, and in the morning Odysseus went to the farm of his father Laertes, and proved himself to him, by pointing out the trees, thirteen pear-trees, ten apple, and forty fig, and fifty rows of vines, which his father had promised to him once when he was leading him, a little child, through the orchard.

Before all was safe, Odysseus with his small force had still to fight against many men of the city of Ithaca, who were kin to the suitors he had slain, and eager to avenge them. But with the help of Athena, Odysseus defeated them, and Athena stayed him when he would have killed them all, and made peace between Odysseus and his people.

Thus Odysseus was safe in his home at last, and ruled in peace for many years. But there is a story that in the end he tired of his quiet life and set forth again to travel, leaving his kingdom to Telemachos. He set forth, with some old men who wished to go with him, and nevermore was heard of. In his poem, "Ulysses", Tennyson represents the aged hero, on the threshold of this adventure, addressing his followers.

MARGARET GRAY

ULYSSES

It little profits that an idle king,
By this still hearth, among these barren crags,
Match'd with an aged wife, I mete and dole
Unequal laws unto a savage race,
That hoard and sleep and feed, and know not me.
I cannot rest from travel; I will drink
Life to the lees; all times I have enjoy'd
Greatly, have suffered greatly, both with those
That lov'd me, and alone; on shore, and when
Thro' scudding drifts the rainy Hyades
Vext the dim sea; I am become a name;
For always roaming with a hungry heart
Much have I seen and known; cities of men
And manners, climates, councils, governments,
Myself not least, but honoured of them all;
And drunk delight of battle with my peers,
Far on the ringing plains of windy Troy.
I am a part of all that I have met;
Yet all experience is an arch wherethro'
Gleams an untravell'd world, whose margin fades
Forever and forever when I move.
How dull it is to pause, to make an end,
To rust unburnish'd, not to shine in use!
As though to breathe were life. Life piled on life
Were all too little, and of one to me
Little remains; but every hour is saved
From that eternal silence, something more,
A bringer of new things, and vile it were
For some three suns to store and hoard myself,
And this gray spirit yearning in desire
To follow knowledge, like a sinking star,
Beyond the utmost bound of human thought.
This is my son, mine own Telemachos,
To whom I leave the sceptre and the isle—
Well-loved of me, discerning to fulfil
This labor, by slow prudence to make mild
A rugged people, and thro' soft degrees
Subdue them to the useful and the good.
Most blameless is he, centred in the sphere
Of common duties, decent not to fail
In offices of tenderness, and pay
Meet adoration to my household gods,
When I am gone. He works his work, I mine.
There lies the port: the vessel puffs her sail:
There gloom the dark broad seas. My mariners,
Souls that have toil'd and wrought, and thought with me—
That ever with a frolic welcome took
The thunder and the sunshine, and opposed
Free hearts, free foreheads—you and I are old;
Old age hath yet his honor and his toil;
Death closes all: but something ere the end,
Some work of noble note may yet be done,
Not unbecoming men that strove with Gods.
The lights begin to twinkle from the rocks;
The long day wanes; the slow moon climbs; the deep
Moans round with many voices. Come, my friends,
'Tis not too late to seek a newer world.
Push off, and sitting well in order, smite
The sounding furrows; for my purpose holds
To sail beyond the sunset, and the baths
Of all the western stars, until I die.
It may be that the gulfs will wash us down:
It may be we shall touch the Happy Isles,
And see the great Achilles, whom we knew.
Tho' much is taken, much abides; and tho'
We are not now that strength which in old days

Mov'd earth and heaven; that which we are, we are;
One equal temper of heroic hearts,
Made weak by time and fate, but strong in will
To strive, to seek, to find, and not to yield.

—*Tennyson*

LIGHT AND COLOUR

IT is something like twenty-five years since the famous Swedish author, August Strindberg, brought up the question whether the brilliant colours of the flowers, now generally considered as means of enticement for bees and butterflies, really have any object at all. "We see", said Strindberg, "how the trees assume their brightest colours in the fall, how their leaves at that time glitter in golden and crimson; and nobody can perceive that this brilliancy of colours is of any use to the trees. If, now, the autumnal crimson garb of the wild grape is meaningless, why believe in a purpose in regard to the blood-red colour-brilliancy of the poppy? Many plants do well enough without insects, and besides is it not impractical on the part of the plants to make themselves dependent for their propagation on such fickle beings as, for instance, butterflies!"

Strindberg changed his opinion before he died, especially in regard to colour, and he knew, like many others, that the splendour of the fall leaves is not only a charm to our eye but also of use to the trees. The red pigment which appears in the cells of the leaves at this glorious time of the year, enables the leaves to absorb the heat in a higher degree than they can possibly do when they are clothed in their usual green garb. If a green and a red leaf are simultaneously exposed to the sun, or to some other source of light, the higher temperature of the red leaf—which often amounts to several degrees—can easily be measured through the application of suitable thermometers. In the fall, when the temperature becomes cooler, this increase of the heat absorbing power is particularly welcome as it facilitates the processes of assimilation. The green leaves of the trees, which during the summer have gathered power from the rays of the sun to convert the carbon dioxide of the air into starch, sugar and proteids, prepare themselves in the fall to die and disappear. But before going into oblivion they make a last effort to surrender to the branches and the trunk what substances they may still possess and they make that wonderful change of colours just for this purpose.

In early spring when the leaves burst their buds and the herbs sprout from the ground, the red tint is also very common among the plants. On closer examination one is surprised, in April and May, to find how many herbs, shrubs and trees really show a red tinge on their leaves and branches. The red pigment plays the same important part then as in the fall, i.e. it absorbs heat, causes an increase in the temperature of the young shoots and leaves, and enables them to grow quicker and live more intensely than the cool air of the spring would otherwise permit them to do. On the approach of summer the red pigment of the plants generally disappears in our latitudes, as during hot summer days special heating devices would be not only superfluous but absolutely injurious. But in arctic regions, for instance on the Spitzbergen, where a day in July is like a cool April day with us, the vegetation shines during the whole summer in a colour scale that varies from brown and rust red to blood red and purple. For in the land of the midnight sun the plants simply have to make a special effort to absorb as much as possible of the amount of heat at their disposal.

It might seem as if the above conditions were opposed to certain well known facts such as, for instance, the colouring of the human race. We all know that in warmer countries the skin of mankind has a decided tendency to turn red, brown and black, the same colours which in northern latitudes serve as heat-accumulators. Among the peoples of the south one would rather expect a skin that might serve as a protection against heat, and for this purpose it would seem as if a clear white might be the most suitable colour. Such, however, is not the case, and this condition also has its scientific explanation. A dark skin, as a matter of fact, is a protection not against heat, but against the chemical rays of the sunlight, also called the ultra-violet rays. These rays, though invisible to our eye, are of vital importance not only in photography, where they affect the decomposition of the bromide of silver on plates and printing papers, but to the medical profession and in the laboratory of nature as well.

That condition of the skin which we commonly call sunburn, and which in extreme cases evidences itself through inflammation, soreness and burning, is caused not by the heat (the dark rays) or by the visible rays of the sun, but by the above mentioned invisible ultra-violet rays. This view was expressed by the French doctor Charcot, in 1859, but its validity was experimentally proved before that time by the Swede Widmark, whose investigations were later corroborated and completed by the Danish doctor Finsen, the renowned founder of the Danish institute for healing by coloured light.

Finsen in one case painted a two inch broad ring around his arm with India ink, and exposed his arm for three hours to intense sunlight. When the ink was washed off, the skin on this ring showed entirely normal white in colour, but on the other part of the arm the skin became red and inflamed. Later, when the inflammation passed, the unpainted part had acquired a brown tinge caused by the formation of a brown pigment through the activity of the ultra-violet rays. Finsen again exposed his arm to strong sunlight, this time without painting it, and the result of the second exposure was that the white part of the skin, which had been protected previously by the layer of India ink, became inflamed while the sunburnt part showed no change at all. The pigment which had been deposited in the under layer of the corium as small brown grains served the same purpose as the ink in preventing the ultra-violet rays from affecting the corium with its fine blood vessels and nerves.

The dark skin colour has nothing to do with a warm climate, as such, but appears only in order to protect the organism against the ultra-violet rays whose action is much more intense in the tropics than in our latitudes. On the contrary, the dark colour actually causes a stronger heating of the skin; but the higher temperature is neutralized, in the case of coloured people, by their heavy perspiration.

From the fact that the ultra-violet rays are capable of causing inflammation etc., in a healthy skin, Finsen concluded that they must increase inflammation already existing. As a matter of fact he proved that in the case of smallpox the suppuration is greatly increased through the action of the chemical rays. No suppuration occurred when the patients were protected against the effect of these rays, the smallpox healed without leaving any scars, and the condition of the patients was generally improved. The simplest treatment would therefore be to place the smallpox sufferer in a dark room, but as this would be rather inconvenient, Finsen excluded the ultra-violet rays by using window panes of red glass which permit only the innoccuous red rays to enter. This cure has later been adopted in different countries, and the Finsen-methods hold a high reputation among medical men.

However beneficial such red rooms are to the patients they have one drawback; flowering plants cannot be grown to advantage in these sick-rooms, as the ultra-violet rays are of invaluable benefit to the formation of flowers. It sounds peculiar, but it is a fact, that the same rays which in the one case originate a nasty suppuration form in the other case, i.e. in the leaves of the plants, those substances that give the charm to the rose and the fragrance to the violet.

P. A. BOVING

ILLUSTRATED LITERATURE UPON SPECIAL SHEEP HUSBANDRY TOPICS AVAILABLE FOR DISTRIBUTION BY THE LIVE STOCK BRANCH, OTTAWA

Copies may be had upon request to the Live Stock Commissioner

Pamphlet No. 1, SOME FACTS WORTH SERRIOUS THOUGHT BY CANADIANS. (Out of print).

Pamphlet No. 2, PREPARING WOOL FOR MARKET.

Contains a short description of methods of shearing and rules for rolling, tying, packing and grading fleeces.

Pamphlet No. 3, WOOL AND ITS MANUFACTURE.

An explanation of the different processes of manufacture, the classes of wool used for various fabrics and the technical terms applies in grading, sorting and manufacture.

Pamphlet No. 4, ADVICE TO THE BEGINNER IN THE SELECTION OF BREEDING STOCK.

Description of all of the most prominent breed types in America.

Pamphlet No. 5, CARE OF THE EWE AND LAMB.

Care of the ewe during pregnancy, at parturition and after lambing, with advice upon the feeding of lambs and treatment of most serious diseases of lambs.

Pamphlet No. 6, ADVANTAGES OF DIPPING.

Description of dips, mode of operation and apparati used for dipping small flocks.

Pamphlet No. 7, PRACTICAL ASSISTANCE TO WOOL GROWERS IN THE MARKETING OF THEIR WOOL CLIPS.

General outline of policy of the Live Stock Branch, Federal Department of Agriculture, in providing assistance to wool growers in the marketing of their wool clips.

Pamphlet No. 8, CARE OF THE RAM AND EWES DURING THE BREEDING SEASON.

Useful advice with respect to feeding and the treatment of most common diseases. A gestation table is also included.

Pamphlet No. 9, CASTRATION AND DOCKING.

Describes several methods of performing both operations and outlines the advantages to be gained.

Pamphlet No. 10, ADVANTAGES OF SHEEP RAISING.

An appeal to Canadian farmers to raise more sheep. Contains figures of production of sheep and wool, also imports for calendar year of 1913-14.

Pamphlet No. 11, HOTHOUSE OR WINTER LAMB RAISING UPON CANADIAN FARMS.

A general discussion of this special phase of sheep husbandry — advantages, breeds, management, marketing and building.

Pamphlet No. 12, THE ANGORA GOAT.

A general history of the raising of Angora goats in their native land and their importation into America. A description of methods of management for mohair production, usefulness as brush destroyers, plans of buildings and treatment of diseases.

OUTSTANDING ACHIEVEMENTS IN AGRICULTURE

By Prof. L. H. Bailey, formerly dean of Cornell College of Agriculture

IT is difficult to state the progress or the outstanding discoveries in the past 15 or 25 years, because the movements have been numerous, rapid and projected from many minds. Within that period the teaching of the colleges of agriculture has taken hold of the imaginations of the people. For years this teaching could not gain a hearing, but finally, almost as if suddenly, it took root. The dreams of the old teachers and prophets became actualities greater even than the dreams. The field began to be seen, the field which is larger than farming as an occupation. More knowledge was demanded. The experiment stations came. Political ideas turned countryward after years of focusing on urban and consolidated affairs. Commercial movements incorporated rural situations into their plans. The great boom periods of opening vast new resources, of projecting mighty transportation lines, of assembling cities as in a night, ran its course and began to slow down. Attention was returned again to the patient industry that underlies it all.

I have no mind to hazard a statement as to where or how the greatest progress of discovery or of benefit has been made. But one thing is clear to me in this country: In the last quarter century the philosophy of rural life as a part in human society has been projected. The underlying and fundamental statements have been made. The course of the final results has been indicated. All the great movements now under way are contained in principle and in embryo in the literature of this period. Applications will be made; enlargements will appear; wholesome new enterprises will develop; constructive geniuses will come into action; but the seers have done their work and the foundations have been laid. We shall have a growing rural literature of great strength, of scientific exactness, and much of it also of artistic beauty, but to this last quarter century men will long look for their inspiration,—back to these days of forecast, of struggle, of freedom from formal restraint when organization and supervision had not yet crystallized and when unification had not been necessary. As I read the fresh prophetic writings of these years, I wonder more and more. Naturalists, scientists, editors, teachers, farmers, preachers, these classes and others have furnished the writers for the new literature; and now-a-days the literature is the most significant mark of our progress.

It is therefore with no uncertain mind that I write these judgments for an agricultural paper, since these journals have contributed so much to the making and the disseminating of this new and prophetic literature. This literature runs back much farther than we are accustomed to think, but most of the bold and confident prophecy is of our immediate time. These strong spirits are dropping off one by one; I wish we knew how to do them greater honor and to praise them more effectively.

The responsibilities of the rural press now become heavy and definite. The many movements and enterprises begin to work themselves out with something like regularity and exactitude. The details of these activities must be reported, and the activities themselves must be judged; and the entire situation is to be measured from day to day as it develops. On the other side, the farm practice journalism is to be kept abreast the time. If the agricultural and rural journalism has exerted great influence in the past, it will be in position to exert still more in the future.

Ohio Farmer

POWDERY SCAB OF POTATOES

United States Pathologists Report on Study of Potato Disease — Limited by Soil and Climatic Conditions

SEVERAL letters have been received recently from State officials, raising the question of the attitude to be adopted toward powdery scab of potato, in view of the recent investigations of this department which have led to the lifting of the second foreign or powdery scab quarantine (No. 11). This memorandum has been prepared to summarize the available information and to give the viewpoint of the pathologists of the Bureau of Plant Industry on this question.

It will be recalled that when the powdery scab was first discovered in imported potatoes relatively little was known as to its nature and nothing of its behavior under American conditions. Quarantine No. 11 was a temporary and precautionary measure taken to safeguard our industry while the necessary investigations were being made. It was at first feared that powdery scab would prove more serious than common scab on account of its canker stage reported from abroad and also that, since as a rule introduced parasites have been more destructive here than at home, it might assume a very virulent form in our Southern and Western States. At that time also there was no record of its occurrence in the United States except in a limtied area in Maine.

During the past two years the following information has been secured which bears on the economic side of the problem.

Origin

Powdery scab has been traced to the Andean region of Peru, and is

Visit the

Good Roads Congress

At Sohmer Park, - - Montreal

March 6th. to 10th. Inclusive

Every citizen who is interested in the welfare of his community should take advantage of this opportunity to obtain information about the kind of good roads that will create better and more economical living conditions in that community.

See our

Concrete Road Exhibit

and learn without cost the advantage, the practicability and economy of the "Best good road"—the Concrete Road.

Our road engineers will be in attendance to give you the fullest detailed information of the economy of Concrete as a road building material. Don't wait for someone else to take the lead. Come in person and get first hand facts. Ask for our free booklet "Concrete Roads".

Concrete Roads Department

Canada Cement Company,
Limited

754 Herald Building, Montreal.

FOR SALE — One crossbred stallion, 6 years old, dark brown colour, weight 1520 lbs., height 5 ft. 2 inc., sired by Almonte, pur registered Clydesdale with Canadian mare. Apply to J. H. CHARPENTIER, St. Liboire, Bagot Cty.

FOR SALE

ONE half-bred stallion, Percheron and Belgian, 8 years old, weight 1850 lbs., very good breeder, dark colour, very well broken. Apply to JACQUES ANTOINE CARTIER, St. Antoine, Vercheres County, Que.

FOR SALE

BROWN Swiss males and females all ages, one of the best dairy breeds in the country, always ready for beef. Average life from 20 to 25 yrs. Address C. E. STANDISH, Ayer's Cliff, Que.

RELIABLE Agents Wanted for selling war souvenirs in America and Canada. Big profit. Apply to Mr. ENOCH JOHNSON, 1182 Broadway, New York City.

believed to be endemic in the native home of the potato. That it is a parasite of long standing is indicated by its manner of developing in the potato with the growth of the potato cells, which remain alive for some time after infection.

Character of Injury

Five types of injury can be distinguished : (1) The characteristic superficial lesions, or sori on the tuber, which are only skin deep and resemble common scab as to type of injury; (2) a shrinkage or shriveling around the spots, due to the loss of moisture, since there is less cork formation under the sori than in the case of common scab. The injury from this may be considerable, depending on storage conditions; (3) an enlargement and deepening of the affected area, due to the germination of the spore balls and the inward growth of the parasite. This affects primarily potatoes carried over to spring; (4) an active dry rot resulting from secondary infection by decay-producing fungi, usually species of Fusarium. This destroys the tubers, but is fortunately not very prevalent except under poor storage conditions; (5) powdery scab also attacks the roots of potatoes, tomatoes, and related Solanaceous plants and produces small galls thereon. The significance of this stage is not yet fully understood.

Geographical Distribution

Powdery scab occurs in eastern Canada, in northern Maine; in Clinton and Franklin Counties, N. Y.; in northeastern Minnesota, in Carlton, Lake, and St. Louis Counties; and on the Pacific coast of British Columbia, Washington, and Oregon. The most painstaking and repeated surveys have failed to show any infection south of New York City, except in one limited area in northern Florida, although it is known that many infected potatoes have been planted in the Atlantic coast section.

Soil and Climatic Relations

Powdery scab appears to be more or less definitely correlated with certain soil types and limited to a remarkable degree by soil and climatic conditions. It is a disease usually occurring only in poorly drained or bog soils in the most northern and humid districts. Its possibilities under such conditions may approximate the reports of serious injury published by investigators in Ireland, but for warm, light, and well-drained potato soils it is believed that the danger is small. Experimental plantings of infected potatoes have been made in nearly all the Eastern States, but no powdery scab could be found on the crop harvested. That climatic factors play a prominent part in determining the prevalence of powdery scab is shown by an experiment in which soil obtained from 10 of these States and transported to a favorable climatic condition produced diseased potatoes in 8 cases, proving that no matter what the source or condition of the soil, powdery scab will not occur unless climatic conditions are suitable.

Control

From the control standpoint it seems probable that the potato industry will adjust itself to powdery scab in the districts where the disease is established. Varietal resistance of a marked degree is shown by some strains. Recent tests indicate also that treatment with hot corrosive sublimate will be an effective means of disinfection and that attention to the soil reaction will have much effect.

Determination of State Policy

It is believed that the Central and Southern States will not need to concern themselves particularly about powdery scab, on account of soil and climatic conditions unfavorable to the disease. The measures that should be adopted to control other common potato troubles will be sufficient. The more general use of certified northern seed is especially to be desired. For the States along the northern border and the Pacific Coast States the problem is less fully settled. Further surveys should be conducted and well-controlled experiments made by the State experiment stations with powdery scab on the principal soil types to determine its reaction to the local environment.

With respect to the exclusion of infected material, it may be pointed out that at the present time there is no movement worth mentioning from eastern United States and Canadian infected areas into the States west of New York, and that no European potatoes are likely to come from infected areas this year.

It is well for protection against this and other seed-borne diseases to caution farmers against purchases of seed potatoes from distant points, but the trend of the evidence at present hardly justifies enforced legal restrictions.

Weekly News Letter,
U. S. Dep. Agric.

THE EDUCATION THAT FITS FOR LIFE

THEORETICALLY, we are all agreed that the only real education is that which fits the child for the life it is to live. Generally we interpret life as "getting a living," but there is a good deal more in education than fitting the child to get a living. "Is not life more than meat; and the body than raiment?"

There are two things involved in education. One is the drawing out or developing, the perfecting of the workings of that piece of machinery in us that we call the mind; so training it that it can think clearly and cogently and accurately. The other is the connecting of the thinkings of the educated person with his actual business in life, so that he can make the work of his hands not merely profitable but pleasurable.

Educators are prone to insist on the first kind of education as the only real education. Now, we can not well overestimate the importance of that development of the mind that will enable a man to use his brain to the best advantage; but the theory that

Every milk can will
be sweet and sanitary
if you always use
Old Dutch

AGENTS WANTED

IN all localities unrepresented for selling our fruit and ornemental trees, Carolina poplars, Norwegian maple with silver leaves; apples trees from 5 to 6 ft., also grafts on roots. Our trees are the most rustic in the province, grown and sold by Canadians. Catalogue, booklet, etc., furnished gratis to agents. Apply Expert Nurserymen, FREGEAU BROS, Rougemont, Que.

FOR SALE—One Percheron stallion, colour blue-gray, weight 1500 lbs., 7 years old, very fine, sound and guaranteed. Moderate price. BAILLARGEON, 329 Ontario East, Montreal.

HYLO SILO

Sweet Fresh Ensilage
down to the last forkful

THE HYLO SILO is perfectly air-tight. No frozen or spoiled ensilage around the walls. Convenient and perfect fitting doors, adjustable without hammer or wrench. Made of Guaranteed Long Leaf Yellow Pine. Built to last a life-time. Stands rigid when empty.

Write for prices and catalogue.
AGENTS WANTED.
Gilson Mfg. Co. Ltd. 414 York St.
(4) Guelph

FOR SALE

ONE fine Percheron Stallion, black colour, imported and registered. First prize and diploma at the Fair of Sherbrooke and twice winner of premium as the best registered stallion of the County of Bagot. Apply to A. LAPALME, Pres., St. Hugues, Que.

WANTED to hear from owner of good farm for sale. Send description and cash price. R. G. List, Minneapolis, Minn.

Better Butter—
Bigger Profits!

If you wish your butter to be smooth and uniform, use the

"BRITISH"
Butter Worker

Adopted by the best dairies in Gt. Britain and Canada. Makes the butter firm—even—consistent all through. Results in better butter and bigger profits!

Sold by dealers everywhere.
Three sizes — 14 in., 17 in. and 20 in. wide.

MAXWELL'S LIMITED, St. Mary's, Ont. 4

CALDWELL'S

Raise calves without milk

Caldwell's Calf Meal enables you to sell your whole milk, yet raise as good or better calves. Tests prove it without an equal for "vealing-up" purposes.

CALDWELL'S CALF MEAL

is rich in protein and furnishes a complete substitute for whole milk. Analysis shows Protein 19 to 20%, Fat 7 to 8%, Fibre 5%. The high quality ingredients as guaranteed to the Government are: Linseed, Wheat, Oat, Corn, Locust Bean, Pea and Molasses Meal in correct proportions to ensure best results.

Caldwell's Calf Meal is a big money-maker for users and has the recommendation of leading stockmen. Write for free booklet.

The Caldwell Feed & Cereal Co., Ltd.
DUNDAS, ONTARIO
Makers of all kinds of high class
STANDARD FEEDS

when a man is thus educated he is competent to deal with any problem of life that may come up lacks a good deal of working out in practice. There are plenty of men who can solve accurately almost any problem that may come up, speak in several languages, are familiar with a half dozen sciences—and yet are not able to turn these to any practical account in dealing with the problems of life. Educators are further very much inclined to the belief that the training of the mind which they call culture can be best obtained by the study of higher mathematics, metaphysics, languages, etc. They forget that there is a vast amount of training or culture to be secured by studying things that have a very practical bearing on the problems of everyday life. If education is to fit us for life, we must not only have the development of the powers of the mind, but the capacity or ability to apply these powers to the every-day problems of existence.

It must not be forgotten that there are vast numbers of people who can not take this higher education, as it is called; whose brains seem to be in their hands rather than in their heads; who can by no process that was ever devised be so educated as to pass an examination for graduation from a high school or for entrance into a college. In fact, the majority of the young people born are of precisely that class, and to attempt to educate them for what nature did not fit them for is simply throwing time and money away, and unfitting them for the real work of life.

The interests of the state demand that these people should have an industrial education or an agricultural education, an education in the line of their life work. If this be true, then our present system of education is terribly lopsided, and will be until we learn that life is a very broad thing, that the natural powers of the human mind are as varied as the occupations of men.

Therefore, if we are to have education that fits for life, we must have education that fits not the few for the life they are to live, but the many. In most of our western states, our system of education is a pyramid, but it is trying to stand on its top instead of on the broad foundation. A broad foundation can not be built by an agricultural college, a university and a normal school. It must be laid in the schools of the open country and in the common schools of the cities and the towns.

Wallaces' Farmer

THE AGRICULTURAL CONQUEST OF THE ATMOSPHERE

By Director Charles E. Thorne, Ohio Agricultural Experiment Station

PROBABLY the most important advance in agricultural progress that has been made since the new century began, if not the most

No Matter What You Want to Shoot

Dominion Ammunition meets every requirement of the sportsman. It has speed, accuracy and reliability, the three factors necessary to perfect ammunition.

Dominion Ammunition

for small game or big, for target shooting or at the traps answers the ammunition question completely. Whether it's the powerful 303, a 22, one of the fast Shot Shells, or the other popular sizes, insist on the box with the big "D". It's the trade mark of Made-in-Canada ammunition that gives perfect shooting results.

Send for free colored hanger "A Chip of the old Block".

Dominion Cartridge Company, Limited,
824 Transportation Building, Montreal.

2

The Fence that every Canadian should buy.

Invincible FENCING and GATES

Made entirely in Canada from the ore to the finished product.
The best quality of Steel obtainable is used in the manufacture of this fencing. "Invincible" Fencing is guaranteed to be made exclusively from "Open Hearth" Steel Wire and heavily galvanized.
"Invincible" Fencing is made in Montreal by Canadians of long experience in the manufacture of wire and fencing. Every roll is guaranteed as to equal strands, straight stays, solid and secure locks, etc.

By our sales method you see your fence, test it and have an opportunity to stretch it before you pay for it.

Write for your copy of our Catalogue. It gives you good information of the wire fence business and we would be pleased to mail you a copy.

The new "Invincible" Pipe Braced Gate Built like a bridge.
This is the last development in the art of gate making. Note the design is similar to that of a bridge, where strength and durability are the chief considerations.
Absolutely the strongest and most serviceable gate on the market.

AGENTS WANTED IN UNREPRESENTED TERRITORY.
WRITE FOR AGENT'S PROPOSITION.

The STEEL COMPANY OF CANADA LIMITED
1272 NOTRE DAME STREET West, MONTREAL.

important that has ever been made, is the mastery of the process by which the free nitrogen of the air has been harnessed and made to do our bidding.

It is an advance which must even take precedence over the electrical transmission of speech, light, heat and power in its ultimate effect on the human race, because this mastery means the potential doubling of the food producing power of the soil.

Man had existed very comfortably and his civilization had reached a very high plane before electricity was made his servant; but this was during an era when the world was young and when millions of acres on each continent awaited the plow.

But the past century has witnessed such a tremendous increase in the world's population that, near its close, Sir William Crookes, in his presidential address before the British Association for the Advancement of Science, marshalled an array of statistics showing that unless the present yield of the land should be increased the time was not far distant when food consumption would overtake production.

For, great as was our advance in the mechanics of agriculture during the last half of the 19th century, that advance has added but an insignificant amount to the acre's yield. When the farmers of Ohio were reaping their wheat with sickle and cradle 60 years ago the average yield of the acre was only two or three bushels less than it is now, and the greater part of the little increase that has been made has been due, not to improvements in farm machinery, but to better drainage and a more effective use of crop rotation, manures and fertilizers, in the light which modern science has thrown upon the fundamental principles governing the growth of crops.

In the address referred to Sir William Crookes called attention to the fact that the earth's ability to feed its increasing population would be limited within a few generations by the available supply of combined nitrogen, showing that existing supplies — the nitrate beds of Chile, the coke ovens and other sources of ammonium sulphate, the slaughter-houses and peat beds which furnish organic nitrogen —could provide only a fraction of the nitrogen that would ultimately be needed, and at the same time he announced the successful combination of atmospheric nitrogen in the electric are producing nitrates at a reasonable cost.

Within a few years this work was in progress in Norway and at Niagara Falls, and the latest report is that sufficient cyanamid is now being produced to supply the larger part of the American demand for fertilizer nitrogen.

The importance of the nitrogen supply is illustrated by the growth of wheat in Broadbalk field, at Rothamsted, England. On this land, which has been in cultivation for centuries, when everything else has been furnished that the wheat crop requires except nitrogen, the 60-year average yield of wheat grown continuously on the same land has been 15 bushels per acre, and when nitrogen has been added the yield has risen to 37 bushels.

In the 30-year test at the Pennsylvania State College Experiment Station, wheat grown in rotation with corn, oats and clover and supplied with phosphorus and potassium has averaged only 18.7 bushels per acre, but when nitrogen has been added the yield has been increased to 25.9 bushels.

For 22 years wheat has been grown in rotation with corn, oats, clover and timothy at the Ohio Experiment Station, and when phosphorus and potassium have been furnished has yielded 20.5 bushels per acre, while nitrogen increased this average to 28.2 bushels.

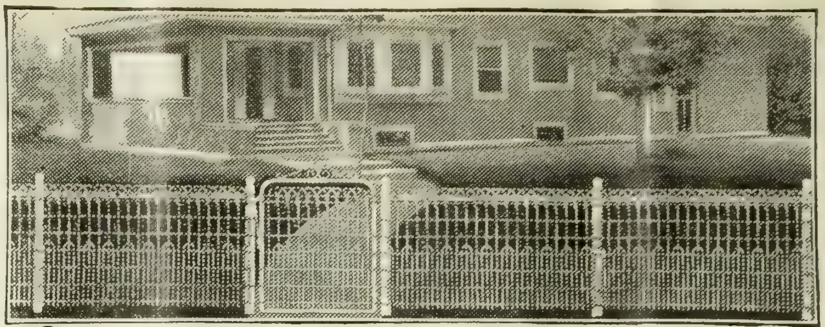
The farmer has learned to look upon clover as a very useful helper in increasing his crop yields, and modern science has shown that the helpfulness of clover is due to its ability to bring free nitrogen into combination, by way of its root nodules.

Where wheat has been grown continuously on the same land at the Ohio station, the 22-year average yield on unfertilized land has been 7.5 bushels per acre. When grown in a three-year rotation of corn, wheat clover, the clover being mown for hay, the average yield has been 12.8 bushels, thus indicating an average gain for the clover roots of a little more than five bushels per acre. Probably this gain might be materially increased by plowing under the clover instead of mowing it, but this would involve the taking of one-third of the land away from food production. Just now this might often be the more economical way of maintaining fertility, but the time is coming when all the land will be needed here, as it is to-day in China, to produce the food required to support the earth's population, and the harnessing of the free nirtogen of the air must therefore be looked upon as one of the greatest achievements of science in its potential effect.—*Ohio Farmer.*

The county fair if rightly organized offers the mass of farmers in a district one of the best means of useful instruction, inspiration, and entertainment. Any sudden or radical change of methods of conducting some fairs would probably bankrupt them. The most needed reforms should be gradual, determined, but constant, until the ideal educational fair is reached.—*Weekly News Letter, U.S. Dept. Agr.*

Do you keep dairy cows, or do they keep you? The "boarder" in the herd can only be determined by the use of the weigh scales and the Babcock butterfat test; don't discard the cow until you are sure that she has been given an opportunity, by good feeding, care and management, to become a profitable producer.

Quality in dairy products is the secret of success of individuals or companies.



(Style "S"—Short bowed stay in lower half, exactly as shown.)

Beauty, Economy, Perfect Weave

These and complete satisfaction you get in Frost Improved Lawn Fence, because—

(1)—It is perfectly woven on the latest automatic power machine, the only one in Canada. The spacing is only 1-3/8 inches, and the fabric is tightly and uniformly woven throughout. Every stay stands straight.

(2)—The material is all our own make best quality heavily galvanized Frost Hard Steel Wire. Laterals are two No. 13 wires tightly cabled, with the deeply crimped No. 9 uprights firmly interlaced.

(3)—Our heavy zinc coating (galvanized) is more durable than paint (which quickly cracks and peels off) and enables us to sell our improved fence at lower prices than the hand-woven, painted fences.

FROST IMPROVED LAWN FENCE

can be erected on wooden or iron posts. It adds beauty and value to any private property or public buildings, church yards, etc. We make three different styles of fabric, and gates with filling to match as shown above.

Frost Angle Steel Picket Fence is widely used for Cemeteries, Manufacturing Plants, Public and Private Grounds, etc. Write us for two-color illustrated folder. 61

Frost Wire Fence Co., Ltd., - - Hamilton, Ont.

VIGORA

SAVES HORSES

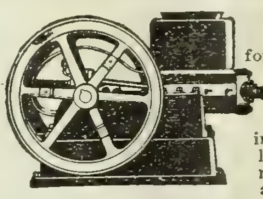
"Vigora" is a sure and reliable remedy for broken wind, coughs, glanders, worms, skin diseases, etc.

PRICE: 50c. A BOTTLE.
ON SALE EVERYWHERE.

Get all information from
J. B. MORIN, Wholesale Druggist
QUEBEC, CANADA.

FOR SALE

FINE STALLION, "Duc de Rotteleur", 6 years old, weight 1825 lbs. This horse belongs to the Company of St. Felix of Kingsey. For further information apply to NAPOLEON GAGNE, president.



"Goes Like Sixty"—"Seils Like Sixty"

GILSON ENGINES

for all power purposes. You cannot afford to buy an engine until you investigate the latest improvements incorporated in Gilson Engines, which place them far in the lead. Send for free catalogue.

GILSON MFG. Co., 27 York St., Guelph, Ont.

Protein Fed Cows are Big Producers

Protein is the one big essential to healthy stock and a free flow of milk. The cow fed solely with home-grown feed which lacks protein must draw on the reserves of her own tissues and soon "eats her own head off." The profitable food is the ration properly balanced with

S-W. Screw Process Linseed Meal

It contains 36 per cent. of protein and makes your herd a source of revenue to be relied upon. Not only does S-W. Linseed Meal supply the material upon which a rich and generous flow of milk is based but it keeps the cattle in good condition. The big dairy countries of Europe have long realized this. They pay a premium for S-W. Linseed Meal. Write for our booklet and prices. It tells how to feed your cows profitably.

The Sherwin-Williams Co.
of Canada Limited
891 Centre Street, Montreal. 2

The JOURNAL of AGRICULTURE

AND HORTICULTURE

[illegible] LIBRARY
APR -6 1916

Volume 19 *April 1st 1916* *Number 10*

Power Sprayer at work in orchard. Capacity 200 gallons, engine 2½ H.P. Output per day, 1200 to 1400 gallons with two men spraying.

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

Made in Canada.

Tarvia
Preserves Roads
Prevents Dust~

Tarvia makes possible Good Roads at Low Cost—

Every taxpayer should be vitally interested in good roads. Good roads in the community mean reduced taxes, increased property values, reduced transportation costs. They are a great factor in the promotion of general prosperity.

From the standpoint of service and low cost the most satisfactory road to-day is a tarvia-macadam.

Tarvia is a coal tar material of great bonding power and is made in several grades to meet varying road conditions.

Under heavy loads a tarviated road is somewhat elastic — not brittle — and traffic wears it smoother.

Such a road is dustless, mudless and automobile-proof.

The Tarvia also has the effect of making the road surface waterproof and preventing ravelling by rain torrents.

Of importance to taxpayers, its cost is more than repaid by the saving in maintenance expenses.

Thousands of miles of Tarvia roads are giving satisfactory service today and hundreds of towns are using Tarvia regularly. In fact, many up-to-date towns build every new road with Tarvia and find that they save money.

If you want better roads and lower taxes, our Special Service Department can greatly assist you. Write to nearest office regarding road conditions or problems in your vicinity and the matter will have the prompt attention of experienced engineers. This service is free.

Write nearest office for free illustrated booklet.

THE PATERSON MANUFACTURING COMPANY, LIMITED
MONTREAL TORONTO WINNIPEG VANCOUVER
The CARRITTE-PATERSON MANUFACTURING Co., LIMITED
ST. JOHN, N. B. HALIFAX, N. S. SYDNEY, N. S.

Road along Lake St. Louis, Point Claire, P. Q. Constructed with "Tarvia-X"

DAIRYMEN

Here is a Feed that is Cheaper and Better than *Bran.*

DRIED Brewers' Grains contain 25 pounds of Protein to the hundred. The best wheat bran averages about 15 pounds to the hundred.

NOW, Protein is **absolutely necessary for cows** for milk production. Feeds, which contain small quantities of protein, will not produce the milk.

YOU **can cut down your feed bills,** and at the same time, **increase** the milk yield of every cow in your barn, by feeding Dried Brewers' Grains in place of bran, or any other grain.

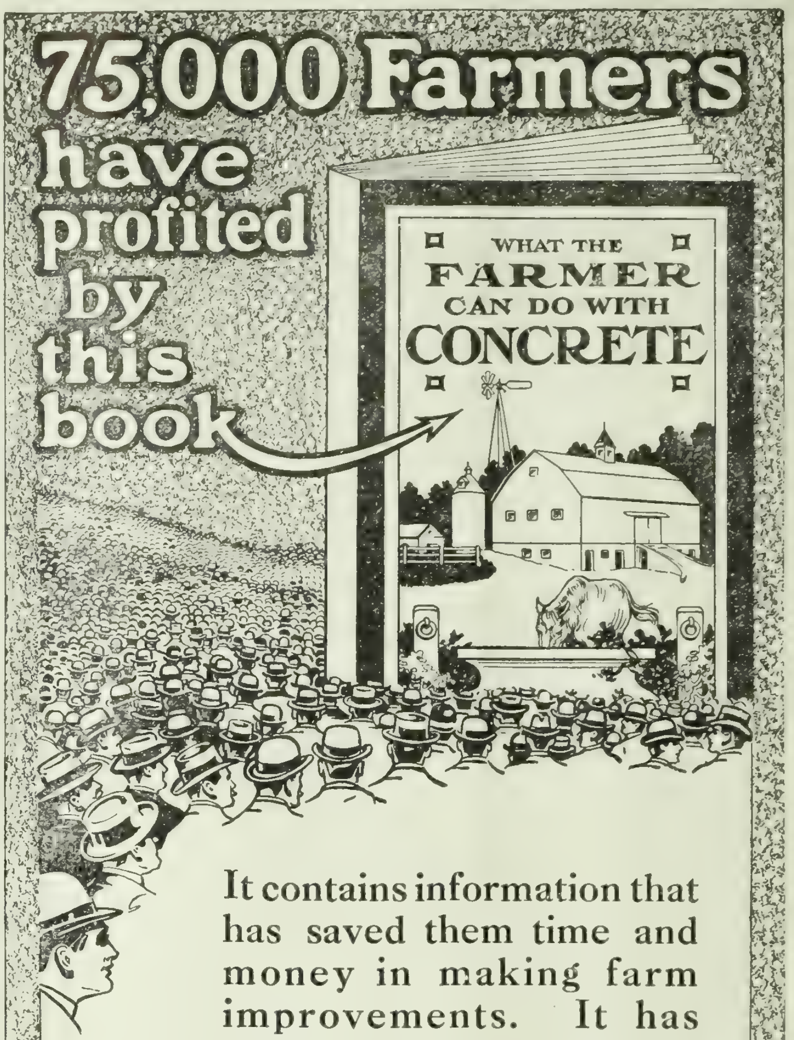
Dried Brewers' Grains

THEY know it is the protein in feed that increases the milk flow. And the more protein they can give the cows in a form that is readily digested, the more milk each cow will give.

WHEN they get Dried Brewers' Grains (which average about 25% protein) **for less than bran** (which averages about 15% protein), quite naturally they feed Dried Brewers' Grains.

Write us for free sample and prices on ton and carload lots.

Molson's Brewery Limited
ESTABLISHED 1786
906 Notre Dame Street East, Montreal.


75,000 Farmers have profited by this book
WHAT THE FARMER CAN DO WITH CONCRETE

It contains information that has saved them time and money in making farm improvements. It has taught them the economy of building everything of everlasting concrete.

There's no other building material as durable, as adaptable, as easy to use or as low in final cost as concrete.

Practically everything that can be built of wood, stone or steel can be made better with concrete and this book tells you how to do it. It is fully illustrated with photos and diagrams and contains 52 practical farm plans.

If you haven't a copy, send for one to-day. Keep it handy. Refer to it often.

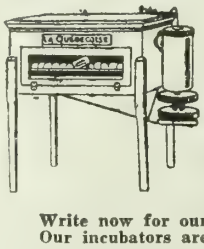
It is free and will be mailed to you immediately upon receipt of coupon below.

Canada Cement Company Limited,
Herald Building, MONTREAL.

CUT OUT AND MAIL

CANADA CEMENT COMPANY LIMITED, Herald Building, MONTREAL.
754 Gentlemen:—Please send me a free copy of "What the Farmer can do with Concrete". 11

Name ....
Street and No. ....
City .... Prov. ....



100% OF HATCHING. CAPACITY FROM 60 TO 2000 EGGS.

"QUEBECOISE" INCUBATOR

Our machines hatch every fertile egg. Full guarantee given. Three different systems, hot air, hot water and electricity.

Made by real experts in chicken raising by incubator, which explain why those machines give continuously large and healthy chicks. With our incubators, no danger of infection; all are lined with asbestos.

Heating, ventilation and moisture are automatically controled. A basin attached at the buttom of heater distributes moisture and renders the machine fireproof. Our prices are from $9.50 to $70.00.

Colony Brooder, portable heater, stove, etc., capacity varies from 50 to 1500 chicks.

Write now for our illustrated catalog and prices, free.
Our incubators are used by the agricultural colleges.

THE J. A. GAULIN CO., Limited, - Beauport, Quebec, Can.

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 92,780
ENGLISH. 9,820
FRENCH. 82,960

Volume 19

APRIL 1st 1916

Number 10

EDITORIAL

AGRICULTURAL MERIT COMPETITION FOR 1916

District No. 2. — Official Notice

THE Agricultural Merit Competition will take place this year in District No. 2 of this province, including the following counties:—

Bagot, Beauharnois, Brome, Chambly, Chateauguay, Compton, Drummond, Huntingdon, Iberville, Laprairie, Missisquoi, Napierville, Richelieu, Richmond, Rouville, Shefford, Sherbrooke, Stanstead, St. Hyacinthe, St. Jean, Verchères, Yamaska.

Farmers desiring to take part in this competition should make application to the Minister of Agriculture, Quebec, from this date up to the 15th June at the latest, on forms to be supplied by the Minister for that purpose.

Applications received later than June 15th will not be considered.

Winners in this district of the Silver Medal and the diploma of Very Great Merit in 1911 are reminded that they have the right to compete this year for the Gold Medal and the Diploma of Highest Merit.

DRAINAGE PLANS

The Hon. J. Edward Caron, Minister of Agriculture, will continue this year to have drainage plans gratuitously prepared by experts in the agricultural colleges of the province.

Farmers who desire to profit by this concession should send in their names to the Minister of Agriculture, Quebec, as soon as possible.

VALUABLE PUBLICATIONS OF THE PROVINCIAL DEPARTMENT OF AGRICULTURE

IMPRESSED with the possibilities of hog production in the province of Quebec, the Hon. J. Edward Caron, Minister of Agriculture, intends issuing bulletins from time to time to advise the farmer how best to meet the requirements of the market.

Bulletins No. 18 deals with "Breeding and Preparing Hogs for Market". In the preparation of this pamphlet the Minister has been assisted by Professor H. Barton of Macdonald College and Mr. R. N. Watt of the William Davies Co. Ltd. The information given is based upon long experience and every farmer is urged to study its contents carefully.

The annual report of the Minister of Agriculture of the province of Quebec for 1915 is now available in both languages. Those who wish to keep in touch with agricultural progress in the province will find the annual reports of the Minister invaluable.

THE AGRICULTURAL JOURNAL OF BRITISH COLUMBIA

WE have just received the first number of "The Agricultural Journal", published by the Dept. of Agriculture, Victoria, B.C. We welcome the appearance of this neat and carefully edited publication among our agricultural exchanges. It is an eight-page magazine, but undoubtedly it will grow under the stimulating breezes of the Pacific. It is interesting to note that British Columbia is the second Canadian province to establish a paper under the direct control of a Department of Agriculture, the first being our own province of Quebec. It is probable that the success of our Journal of Agriculture was a factor in the founding of the new Journal by our friends on the Pacific slope. We wish it every success.

DEATH OF A GREAT AGRICULTURAL EDITOR

DR. Henry Wallace, widely known at the Editor of "Wallaces' Farmer" of Desmoines, Iowa, and to its readers as *"Uncle Henry"*, died on February 22nd in Desmoines at the ripe age of 80 years. Though his name is not so well known in Canada as in the middle western States, we desire nevertheless to place on record our strong personal appreciation of Henry Wallace as a man and of his life work for the improvement of rural conditions.

A few years ago he did us the honour of spending nearly a week at Macdonald College, so we came to know him rather intimately. We were impressed with his vast fund of general agricultural information, with his strong lovable character and with the high ideals and the earnestness with which he was devoting the mature years of his life to his chosen work.

He was trained for the Ministry and preached for 15 years, when he was compelled to resign on account of bad health. Then he took up farming and made a success of it. His articles on agricultural matters to the "Iowa Homestead" attracted attention, and before long he was asked to become its editor. This position he held for twelve years, and in 1895 he and his sons founded *Wallaces' Farmer.*

Henry Wallace occupied many positions of trust in his own country. In 1908 President Roosevelt appointed him a member of the Country Life Commission. In 1910 he was president of the National Conservation Congress. In 1911 he was chairman of the National Committee on Men and Religion Movement. In 1913 he, with Secretary Wilson, was appointed to investigate agricultural conditions in Great Britain.

One noteworthy feature of Henry Wallace's life is that the big and best part of his work was done after he was 60 years of age. He was no believer in retiring from work. He believed that a man was happiest when he was thoroughly engaged in something that helped to uplift his fellow men.

His death is a national—yes, an international, loss on account of his uplifting influence expressed in the pages of *Wallaces' Farmer*, in his splendid addresses at big movement conventions, and in his personal intercourse with thousands of people.

In the words of *The Rural New Yorker*: "Henry Wallace was a strong national character, the leading citizen of Iowa, and the best exponent of farm journalism this country has yet produced."

A SATISFACTORY DOG LAW

IT gives the Journal great pleasure to announce that the Hon. J. Ed. Caron has added another to his many services to Quebec agriculture in drafting and putting through the Legislature a revised law for the establishment of a compensation fund for sheep owners who have suffered losses from the depredations of dogs. The new law provides that upon petition of twenty-five resident ratepayers every municipality shall forthwith pass a by-law imposing an annual tax of one dollar on each dog or spayed bitch and of four dollars on each bitch kept within the municipality. The funds so obtained are to be devoted to the compensation of sheep owners to the extent of two-thirds of the damage suffered from dogs, the amount of compensation for any one sheep, however, being limited to fifteen dollars. Competent assessors are to be appointed to valuate all such losses. The compensation fund may also be drawn upon to pay the expenses of unsuccessful prosecutions of dog-owners. Judges are empowered to order the destruction of dogs which have killed or injured sheep.

We think all sheep owners will agree that this law is a great step in advance and that it will do much to encourage sheep-breeding in the province. It should be possible to secure the passage of the necessary by-law in all our rural municipalities and even in most towns, for there can be few in which it is not possible to find 25 ratepayers with sufficient interest in the sheep industry to sign the petition. The more sheep the more wool, the more wool the cheaper clothing and the more money passing from the farm to the town to enable the townsmen to buy clothing. All that is now necessary is a little local effort and our Wool Growers' and Sheep Breeders' Associations may be counted upon to make that effort.

CONTENTS

EDITORIAL: — Agricultural Merit Competition. — Drainage Plans. — Valuable Publications of the Provincial Department of Agriculture.—The Agricultural Journal of British Columbia.—Death of a great Agricultural Editor.—A Satisfactory Dog Law.

ORCHARD AND GARDEN: — Some Aspects and Prospects of the Maple Industry.—Care of the Apple Orchard. — Top Grafting. — Raise your own Seed Potatoes.—Fire Blight.

FARM AND FARM CROPS:—Shawville Seed Fair. — Canadian Seed Growers' Association Spring Catalogue. — Seed Corn. — Springtime Hints.—Figuring Loss from Smut.—Seed Grain. —Spring Work in the Fields.—The Alfalfa Crop.

LIVE STOCK: — Water, Air and Food as Factors in Disease.—Mr. St. Marie of Compton.—General Breeders' Association of the Province of Quebec.—Ayrshire Heifers for California.—Treatment of the Mare in Foal.—Fresh Air and Exercise for Brood Sows.

DAIRY:—New Possibilities in Dairying, (Continued). — Huntingdon Dairymen's Association. — Maud S. and Dan Patch. — Skim Milk Variety.—Seasonable Suggestions.

POULTRY:—Egg Cases and Fillers.—Securing High Fertility. — How to Hatch Chicks.—Brooding Chicks.—Poultry Department Extension Work, Macdonald College.

WOMAN'S WORLD:—Foods and Food Preparation. — Quebec Industries and their Encouragement.

GENERAL INTEREST: — Profitable Production.—Mice and Apple Trees.—Degeneration of Potatoes.—The Greatest Enemies of Agricultural Progress.—History of the Silo and Ensilage.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

Suddenly the station-master appeared, and, approaching one of the most vigorous baggage-bashing porters, shouted in stern tones:

"Here, what do you mean by throwing those trunks about like that?"

The passengers pinched themselves to make sure that they were not dreaming but they returned to earth when the official added:

"Can't you see you're making big dents in the concrete platform?"—*Tit-Bits.*

THE GARDEN AND ORCHARD

SOME ASPECTS AND PROSPECTS OF THE MAPLE INDUSTRY

By John H. Grimm, Montreal

(An Address to the Pure Maple Syrup and Sugar Co-operative Agricultural Association, at Rigaud, February 29th).

IT is not my intention to dwell on what has been done in the past by this Association, but rather to confine my remarks to what we intend to do in the future, as this will probably interest you more. There is one very important matter, however, which I wish especially to bring before your attention, and that is the new Dominion law of April 15th 1915—a law which if properly enforced by the Inland Revenue Department will put the maple industry in its proper place. What is mainly required is the enforcement of this Act, which is, as you are all no doubt aware, very thorough-going in its provisions.

The New Act suppressing Spurious Products

Since this Act was passed there have been two collections made by the Inland Revenue Department at Ottawa. Bulletin No. 324 reports an inspection of maple sugar, embracing 234 samples, of which 204 were found to be genuine, 5 to meet legal requirements, and 25 to be adulterated. Bulletin No. 325 reports an inspection of maple syrup, in which out of 243 samples, 192 were genuine, 4 were found to meet legal requirements, 1 was doubtful, 4 illegal articles and 43 were adulterated. Even this shows a very marked improvement over all previous years and now that a large number of the grocers handling adulterated maple sugar and syrup have been brought before the courts and obliged to pay fines, it is very doubtful whether they will handle the same brands again. I look forward to even a very marked improvement in the next issues of these bulletins.

Good Prices assured

Since these grocerymen have been brought before the courts of justice, there has been an increased demand from all parts of Canada for *pure* maple syrup and *pure* maple sugar. Enquiries have also been received from abroad and, if I mistake not, we are just on the eve of great prosperity in this important industry. While we may not see a marked improvement in the production this spring, the years following will surely show better results not only in production but also in quality and consequently in price.

The principal grounds for this hope are the protection afforded the industry by the new law and the impending removal of the duty on maple goods entering the United States. This duty comes off May 1st 1916.

The short crop of last season, while regrettable at the time, is in my opinion just what the makers needed. Had we had a large production in the past year of war conditions and tight money, the price of syrup would certainly have dropped. The scarcity of the supply has produced exactly the reverse effect, and has in a measure established an advanced price for the coming spring's crop.

The increased demand throughout Canada is due to the confidence restored between producer and consumer. The demand from abroad is largely due to our soldiers asking for maple products.

Prompter Boiling and Bigger Buckets

The average sugar-maker is not exercising sufficient interest and care in regard to the quality. There is altogether too much of the third and fourth grades of maple syrup and maple sugar produced. This is principally due to a lack of cleanliness and to keeping the supply of sap in wooden vessels after it has left the trees, and keeping it too long before boiling, — in other words, to a lack of attention.

I also want to speak about the waste or loss of sap owing to inadequate bucket capacity. The sap buckets commonly used in the Province of Quebec are just about one half as large as they ought to be, and I am positive that half the sap that runs from the trees is wasted by overflowing the buckets. I am sure that if we improved the

A Sugar Bush in Quebec.

quality and prevented the loss, the annual value of our maple products would be more than doubled.

Labels required by Law

I wish to bring to your attention the great importance of labelling all packages containing maple syrup and sugar. By referring to Section 5 of the Act adopted last year you will see that Section 37 of the Adulteration Act now provides a penalty for *neglecting* or *refusing* to label or mark any article of food in accordance with the requirements of the Act. The lowest penalty for a first offence against this provision is $25, and for a second offence $50.

I believe it is also to the best interest of the packer to label his goods, so that customers may have his name and address before them for repeat orders. I would strongly recommend that every maker of maple syrup and maple sugar see that his cans or packages are properly labelled with his name and address.

Overseas Shipments

(The speaker then referred to the gifts of sugarmakers to the Red Cross Hospitals in England and France, and of the appreciation of this very welcome donation the wounded soldiers and the medical officers had expressed. An appeal for such gifts was to be made again this year, and he hoped that the number of contributors would be two or three times as great as last year, when about 900 had responded. The sending of the maple syrup to the old countries had already led to a request from England and France for 50 tons of sugar each for commercial purposes).

The Government Schools

The work done in the three maple syrup and sugar schools in the province of Quebec has helped very largely to improve the qualities produced in their respective districts. If I am not mistaken there are to be one or possibly two additional schools in the province this year and if each sugar maple county had a school of this kind there would be none too many. The amount appropriated by the Quebec government for educational work in connection with the maple industry is $3000. It is regrettable that no similar appropriation has been made in the province of Ontario, which has many districts both in its older and in its most recently settled territories where this industry can be carried on on a large scale.

Friends at Court

I feel sure that the members of this Association appreciate the work accomplished for the industry both by the Hon. Martin Burrell and by the Hon. J. E. Caron, and I hope they will continue to lend every assistance in their power to the furthering of its interests.

Join the Association

In conclusion I wish to state that our membership is not sufficient to enable us to carry on the work of the Association in a proper manner. We should have at least 2000 active members. The subscription rate of $1.00 a year is not excessive in proportion to the benefits derived from membership, and I hope every producer of maple syrup and sugar will join and take an active part in promoting the welfare of the Association.

We should also have more meetings. Four of this character annually in different sections of the province of Quebec would be none too many.

THE CARE OF THE APPLE ORCHARD

PRUNING THE ORCHARD

THOROUGH PRUNING is essential to thorough spraying. Prune during the milder weather of January, February and March. Prune each year. Satisfactory results cannot be obtained where pruning is done only once every five or six years.

Young trees:—Three to five main limbs, 2½ to 3 ft. from the ground are sufficient. Heavy pruning induces wood growth which is desirable in young trees. Prune to form a well balanced top with plenty of room for full development of all main limbs. Cut out cross limbs and head back main leaders by ⅓. Keep the tree compact and well thinned out.

Bearing trees:—Cut out all dead, badly diseased, or broken limbs. Where limbs cross or interfere cut out the least desirable or upper one. Keep trees from growing too tall by heading back. Tall trees are difficult to spray, prune and pick. Do not leave stubs, make clean cuts close to main limb. Prune annually. Severe pruning in bearing trees induces wood growth and lessens amount of fruit.

Very high trees with long bare limbs if not too old or badly diseased can be cut back severely, as much as ⅓ to ½ the top. This will cause them to branch out and a new top can be formed, but do not allow it to become too high again. Keep it properly thinned out and headed back.

Gather and burn all prunings or diseased wood. Where the trunk and large limbs of bearing trees are encrusted with old scurfy bark remove it by scraping, leaving the healthy bark smooth. Clean out and remove all dead and diseased bark and paint crevices with a white lead paint.

Protection from mice:— Field mice frequently do much damage in an orchard by girdling the trunk of the trees near the ground, usually working under the snow. Wrap the trunks of the trees in the fall with a good grade of white building paper, taking care that no mice may get in under the paper at the ground. A good practice after wrapping is to bank up with a little earth.

CHIEF INJURIOUS INSECTS

Codling Worm:—The pinkish caterpillars enter the young fruit usually at the calyx end 2 to 3 weeks after the blossoms fall, and become full grown in 3 to 4 weeks. They then emerge from the fruit and form cocoons under bark etc., where they remain all winter.

Bud Worm: — Early in the spring the dark-brown black-headed caterpillars attack the bursting buds, boring into them and eating the flowers and leaves. They tie the leaves together and pupate within. The moth lays her eggs in June.

Plum Curculio:—This insect attacks apples as well as plums, and passes the winter as a beetle under rubbish etc. It emerges early to feed on buds, etc. The eggs are deposited in the young fruit, and the grub tunnels in the fruit for about 3 weeks, usually causing the apple to fall. The grub leaves the fallen fruit and goes into the ground. Later the adult beetles appear and puncture fruit but do not lay eggs.

Tent Caterpillars: — They pass the winter as eggs laid in bracelets about the twigs and branches. The eggs hatch in May and the caterpillars reach maturity in June in 4 to 5 weeks. One species forms webs at the angles of the branches. The cocoons are formed under bark, etc. and the moths emerge in July to lay eggs. One generation in a year.

Canker Worms: — The caterpillars are measuring-worms and appear in the spring. They feed for about a month, then pupate in the ground. In one species the moths appear in the fall and lay their large clusters of eggs on the bark or leaves; in the other species the moths do not appear until spring. The females are wingless.

Leaf Rollers:—The moths appear in June or July and lay patches of eggs on the branches. The eggs hatch the following spring and the young green black-headed caterpillars attack the buds, roll the leaves together and eat holes in the side of the fruit. The pupae are formed in the rolled leaves within a flimsy cocoon.

Apple Maggot:—The eggs of this fly are laid in July and the small white maggots work for 4 to 6 weeks, making winding tunnels in the fruit, which usually falls to the ground. It winters in the ground.

Plant Lice or Aphids:—These are *green* or *rosy* sucking-insects, feeding on the leaves and twigs. They pass the winter as black eggs on the branches and twigs; these hatch in the spring and several generations of female appear, some winged, others wingless. The Rosy aphis leaves the apple after three generations and returns in the autumn. Multiplication is very rapid during the summer.

Oyster Shell Scale or Bark Lice:—These sucking insects appear as small oyster-shell scales on the bark. They pass the winter as eggs under the scales. Early in June the eggs hatch and the young lice move about on the twigs for a week or so, then settle and begin secreting a scale. The insects become full grown in August when the eggs are laid. One generation in a year.

Apple-tree Borers: — These insects are serious pests in some orchards. The eggs are laid in June in incisions or cracks of the bark. The grubs tunnel out channels in the wood. The *Round-headed Borer* lives from two to three years in the tree, but the *Flat-headed Borer* matures in one year. Cut out or probe out the borers with a knife and stout wire; apply *alkaline wash* in May to the trunk and lower limbs.

CHIEF INJURIOUS DISEASES

Apple Scab:—This fungous disease causes brown spotting and often falling of the leaves, black pustules on the fruit twigs, and scabbing of the fruit. Summer spores are produce in all these cases, and by these the disease is spread from tree to tree and from leaf to fruit. Winter spores are produced in infected fallen leaves that have lain on the ground all winter. These spores are set free in the spring and infect the young leaves. This disease seems to thrive best during *cool, moist* weather.

Apple Cankers: — There are several kinds of apple cankers in Quebec orchards: — (1) *The Black Rot Canker.* (2) *The European or Nectria Canker.* (3) *Twig Blight Canker.* (4) *Sunscald and Frost Cankers.*

The Black Rot Canker is produced by the fungus that causes the Black Rot Disease of the leaves, twigs and fruit. The bark becomes discolored, roughened, and thickened. Infection occurs mainly through wounds in spring. It often follows sunscald and frost injury.

In trees affected with the *European Canker* the bark is destroyed, often cracking in a concentric manner. Afterwards the wood is also destroyed, girdling often occurring. The thickened irregular margin of the wound is often characteristic. Both summer and winter spores are produced.

In cases of *Twig Blight Canker* bacterial infection occurs usually at blossoming and the disease extends down the twigs and branches, causing first a wilting afterwards a blackening. Cankers are often formed at wounds made by pruning. This same disease may manifest itself as Blossom Blight, and Tig or Fire Blight.

Sun scald and Frost Cankers occur on the south and southwest side of the tree. During warm days in winter the tissues on the sunny side are warmed up and are incited to renewed activity. Such tissues suffer from subsequent freezing by the loss of water from the cells. Afterwards they contract and crack open. Disorganization sets in and saprophytic fungi effect an entrance, and keep the wounds open. Collar Rot and Crotch Cankers are also forms of winter injury.

SPRAYING

FIRST SPRAY:—

Time — Just before growth starts in the spring. (Usually about the 15th April).

Material — Lime Sulphur 1.03 sp. gr. or 1 gal. commercial strength L.S. to 10 gals water.

Pests destroyed — Scale insects, Apple scab, Aphid eggs, Budmoth, Tent Caterpillar's eggs.

SECOND SPRAY:—

Time — Just after first leaves open and before the blossoms open. Never spray when trees are in bloom.

Material — Lime Sulphur 1.009 sp. gr. or 1 gal. commercial strength L.S. to 35 gals. water, with lead arsenate (paste) 3 lbs. to 50 gals.

Pests destroyed — Apple scab, Budmoth, Tent Caterpillars, Canker, Worms.

THIRD SPRAY:—

Time — Immediately after the blossoms have fallen.

Material — Lime Sulphur 1.008 sp. gr. or 1 gal. commercial strength L.S. to 40 gals. water, adding Lead Arsenate (paste) 3 lbs. to 50 gals.

Pests destroyed — Apple scab, Codling Moth, Fruit Worms.

FOURTH SPRAY:—

If necessary a fourth spraying is given two weeks after the third spray for apple scab and leaf eating or fruit eating insects. Material same as for third spray.

If aphids or plant lice appear add Black leaf 40, ½ pint to 40 gallons and apply with the second spray. Spraying is accumulative in its effect. Best results will not be obtained the first year. Good spraying and good pruning go hand in hand and these with proper cultivation and fertilization, provided the varieties are good, make for success.

Spray Pumps: — In small orchards a barrel spray outfit will answer. Maintain as high a pressure as possible.

A gasoline power sprayer is the most satisfactory in large orchards of ten acres or more. Maintain a pressure of 175 to 200 lbs. They economize spray material, and permit of rapid and thorough work. The disc type of nozzle is the best for general spraying. Use a 6' to 12' bamboo spray rod with drip gard with at least 25' spray hose.

FERTILIZERS

Barnyard manure is best, applied broadcast about the trees and out a few feet beyond furthermost branches. Ten to twelve good loads per acre make a fair amount. Wood ashes are first class for a bearing orchard, also moderate applications of potash and phosphoric acid. Nitrogen is not specially needed where clover and cover crops are grown annually.

CULTIVATION

Increases the vigour of the trees, allows them to carry more and healthier foliage, consequently greater growth is made and the trees bear more fruit and tend to bear anually under uniform, good conditions. Young trees should be kept cultivated close up to the trunks but bearing trees may have a strip of sod along the tree row. Three to four inches is deep enough to cultivate. Never take hay from an orchard if you wish to get good crops of apples. Early spring cultivation is most important, just before or as the first leaves open and should be continued every two weeks until July 1st, when a cover crop should be planted.

Cover Crops:—Crimson clover seeded sixteen to twenty pounds per acre is best. Red Clover 20 lbs. per acre, or hairy vetch 60 lbs. per acre, are also desirable. Rape 6 lbs. per acre is cheap and makes a big growth, but is not as valuable or as desirable as clover or vetch.

CO-OPERATION

Where growers have small orchards it is advisable to co-operate in the purchase of a satisfactory spray pump, for one pump many easily spray five or six small orchards provided they are not too far apart. Also arsenate of lead, sulphur and lime can be purchased in quantity much cheaper than in small lots. A number of people can combine to make their own lime sulphur.

VARIETIES

McIntosh and Fameuse are two of the best apples grown and there is an unlimited demand for them in their season, October to January, at high prices. At least fifty percent of the commercial orchards in this province should be McIntosh and Fameuse. Do not plant too many varieties, four to five are sufficient in most cases.

Recommended:—

Summer — Yellow Transparent, Duchess.
Autumn — Wealthy, Dudley.
Early Winter — McIntosh, Fameuse.
Winter — Bethel, Scott Winter, Pewaukee.

PREPARATION AND USE OF THE BEST SPRAYING MIXTURES.

LIME SULPHUR SPRAY

1. *Commercial Lime-Sulphur*

(a) For dormant spray when no leaves are on the trees, 1 gallon to about 10 gallons of water.

(b) For summer spray, 1 gallon to 35 or 40 gallons of water.

2. *Home-made Concentrated Lime-Sulphur*

Formula:—
50 lbs fresh lime (unslaked)
100 lbs sulphur
40 gallons water.

Heat water (20 gallons) to near boiling and add the fresh lime. While slaking is in progress add with frequent stirrings the sulphur which has been made into a paste.

Add water to make up to 40 gallons; boil for an hour replacing the water lost by boiling. Strain through a 20 mesh screen, and place in storage barrels. By means of a lime sulphur hydrometer the amount of dilution can be determined for each spraying.

(a) The dormant solution should have a specific gravity of 1.03, and the summer spray 1.01 or 1.009. If the concentrated solution has a specific gravity of 1.27 the dilution for the dormant spray is .27÷.03=9. that is 8 gallons of water are added to 1 gallon concentrate to make 9 gallons of spray liquid.

(b) The dilution for the summer spray is .27÷.01=27. that is 26 gallons of water are added to a 1 gallon of the concentrate.

The amount of spray liquid varies with the size of the tree. A thrifty nine year old tree on the average requires 1¼ gallons for the dormant spray and 1 gallon for each of the later sprays. A thirty year old tree requires 5 gallons for the dormant spray and 4 gallons for each of the later sprays.

Lead Arsenate is used with the Lime Sulphur as an insecticide at the rate of 3 lbs. (paste) to 50 gals. water. The paste should be mixed thoroughly with a small amount of water before putting it in the spray tank. The dry arsenate of lead is not recommended to be used with the lime sulphur and paris green should never be used.

Black Leaf 40 is used for aphids and is applied at the rate of ½ pint to 40 gallons. It may be applied with the lime sulphur or arsenate of lead sprays when necessary to use it.

Alkaline Wash for borers is made by mixing soft soap and a strong solution of washing soda in water to a consistency of soft paint, add 1 pint of crude carbolic acid to every gallon of the wash. Apply to the trunks of trees with a brush about the first of June.

TOP GRAFTING

Top grafting is practised principally for the purpose of making an unprofitable tree bear good fruit.

Grafts may be put on young or old trees, but for the most part only bearing trees have been top worked.

Top grafting is done in the spring just before growth begins but may be carried on even when trees are coming into leaf, provided the scion is quite dormant. The chances for success are much lessened if it is done late.

The scion is a cutting made from the well matured wood of the current season's growth from a tree which is the variety you wish to grow. These are taken sometime during fall, winter or early spring. Probably the best course to follow is to take them late in the fall, tie them in small bundles and pack away in moist sand or moss in the cellar so that they will not dry out or yet be too wet and as a consequence decay. They must be kept dormant.

Before cutting back for grafting.

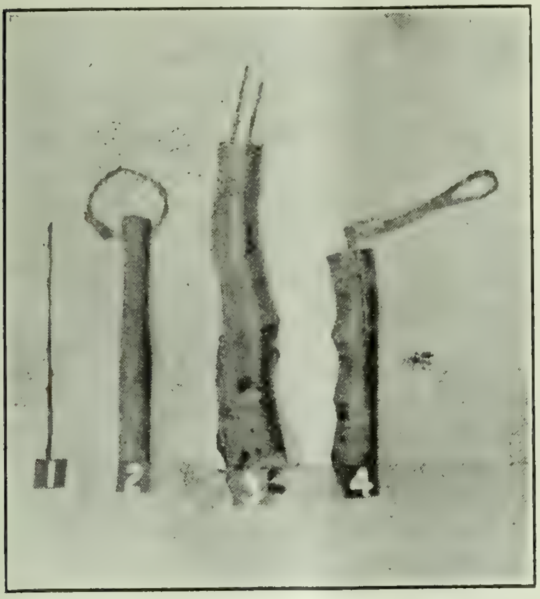
For stock or tree on which to graft select a healthy, hardy, long-lived variety as Haas, Hibernal, Tolman Sweet. Do not cut off too much of the top in one year. It is better to take three or four years to remove completely the old top.

Select branches about an inch or an inch and a half in diameter on which to put the scions. They heal better on this smaller and fresher wood. After the branch is sawn off the stub is split by means of a mallet and strong knife to the depth of an inch and a half or two inches. It is held open to receive the scion by driving a wedge in it. Now cut your scion three or four inches long so as to have about three strong buds; make it wedge-shaped at base and a little thicker on one side than the other. Two scions are now inserted in the split stub so that the lowest bud on the scion is just at the top of the stub and the inner bark of the scion and stub meet. This is necessary to make a union. The stub is now covered with grafting wax so as to keep out water and air and allow it to heal. Cut off any sucker growth which may start on the stub as this would interfere with the growth of the scion, taking much energy from it.

GRAFTING WAX

Composed of the following:—

Tree cut back and Top grafted. One year after cutting back.



1—Scion stick.
2—Mallet.
3—Scions, set in the cleft on the steel.
4—Cleft held open by Wedge on knife.

Resin 4 parts, Beeswax 2 parts, Tallow 1 part, by weight.

Melt together and pour into a pail of cold water. Grease or oil the hands and pull the wax until it is nearly white. If this becomes hard heat it and work it with a little oil or tallow.

A. C. GORHAM,

Horticultural Dept.,

Macdonald College

RAISE YOUR OWN SEED POTATOES

RAISE the standard for seed potatoes and get bigger yields. Most of the crops throughout the country are grown from the culls, the small inferior left-overs which are very liable to be diseased. The average yield in Ontario and Quebec during the past season was not 100 bushels per acre yet where the proper methods were employed from a number of crops the average was 288 bushels per acre. 300 bushels and upwards should be the aim.

Market Demands

What the market requires is what we should strive to grow. To-day it is the medium sized, flat, white potato, with shallow eyes, thin skin and free from scab and other diseases which is most in demand. Fix an ideal in your mind and work to produce that ideal. The first essential to successful seed potato growing is good soil that is strong in vitality and vigour. Without either of these good crops of potatoes cannot be raised.

A good Soil

A sandy loam well supplied with manure either by turning under a clover crop or by applying rotted manure in the fall (20-30 tons per acre) making a fine loose seed bed that will hold plenty of moisture and allow free circulation of air, but must be well drained. The seed bed should be deep to provide plenty of forage ground for the roots of the plant. The potato plant yields out of all proportion to the outlay where deep cultivation is practised. Plow the land well in fall, setting it up well to the action of frost. In spring use the disc harrow or spring tooth to break up sod. Follow this by a leveller to take down any ridges.

Use Seed True to Type

To get high grade seed potatoes we must select from the best type of the variety to be used. Where selection has been carefully done in the fall, and the seed potatoes properly stored in crates, they are ready for treatment and sprouting, but where seed must be selected from the bins, care should be taken to select only true-to-type potatoes, as the very fact that they are true to type is in itself an indication as to their quality, and they will be more likely to start the one master sprout which usually produces a stronger plant and a better yield of potatoes than is obtained where more than one sprout starts. Where the grower is compelled to get his seed from outside sources he should try to obtain it from growers whose average yield of market potatoes is good (from 300-500 bushels per acre) and whose stock is clean and free from disease. Potatoes from such fields must have plenty of vitality and vigour or such yields could not have been obtained.

Treat Seed for Scab

Before cutting seed should be soaked for two hours in a solution of one pint of formalin to 40 gallons of water. Place in shallow crates in the dark until just started to sprout, then spread out in light so that the shoots will become thoroughly greened and toughened, when they are ready to plant either by hand or machine.

Select from the best Hills

Before the plants have died down, as soon as the foliage is in the "sear and yellow" stage, the crop should be harvested if it is to be used for seed. In hill selection considerable dependence can be placed upon the appearance of the tops. A large top with one sturdy stem is usually found to have more and better potatoes under it than a hill with several weak stems. Select those hills in which there are a goodly number of tubers, *all of them of good shape* and most of them good uniform size and discard those whose shape is poor and the sizes very variable, even though these might be quite a number in the hills. The best average size is 3 ounces. Store enough of the very best selections for your next year's seed crop, and use the balance for your next year's crop or for sale as you may wish. In this way the purity of variety and the vitality of your seed potatoes are steadily maintained, and high yielding seed produced that should be worth several times the price of ordinary seed potatoes.

Important Points

Always use true-to-type seed from high yielding crops.

Use only immature seed, sprouted and greened before planting.

Treat all seed potatoes with corrosive sublimate or formalin.

Plant seed potatoes late, and harvest before mature.

Don't plant potatoes on ground that has been in potatoes for a number of years.

Adopt a rotation of crops that provides for potatoes only once in five years on same ground.

Good seed is cheaper than poor seed, even though first cost is twice as much.

A. C. GORHAM

FIRE BLIGHT

IN the November number of the Journal we advised fruit growers what to do in order to check the fire-blight disease in apple and pear trees, but the cutting out of the diseased parts in early winter is not sufficient and in the spring the owner must be again on the lookout so that he may stamp out the disease altogether.

As soon as the growing season commences the trees should be inspected weekly and all shoots and water spouts removed from the trunks and main limbs as soon as they appear. If this is not done aphids will invade these shoots and if carrying the infection will cause body cankers. The cutting out of such body cankers involves considerable labour.

The cutting out process having been performed thoroughly in the fall and all the wounds disinfected, and all the diseased cuttings burned, no infectious material is in the orchard itself, but bees and other insects will carry disease bacteria from the surrounding orchards and blight will start in the blossoms. As soon as the blossoms begin to fall the diseased blossom spurs must be broken out and burned. If this blossom blight is absent the aphids, when they appear later, will be unable to carry the disease and the owner of the orchard saves himself much labour. At the same time, it is advisable to spray carefully with lime-sulphur to control the insect pests. The first spraying should be done when the buds begin to swell.

The expense of keeping the orchard clean is really trifling. Once all diseased material is removed the yearly cost can be limited to $25 per 1000 trees if the work is done thoroughly and intelligently. The first individual grower commencing to check the disease in his district will have some disappointment, as his land will be surrounded on all sides by infected orchards. However, every neighbour who joins in the movement helps to decrease the chance of infection, and when once whole districts are regularly inspected the disease will be a thing of the past.

At present Quebec is not seriously threatened, but the more extensive and intensive apple growing that we notice on all sides, and the possible adaptability of the disease organisms, would suggest prompt action.

J. VANDERLECK

PART of the equipment of the modern farmer is a practical knowledge of and business acquaintance with farm pests.

* * *

The farmer generally breeds on his own farm those insects which later devastate his crops. By cleaning up fence rows, hedge rows and burning refuse we can rid ourselves of many of these pests. Thousands of grass-hoppers breed in a narrow uncultivated fence row.

* * *

The rotation of crops is the greatest control method for farm pests generally. On account of white grub damage it is best not to plant corn on newly plowed sod or pasture land.

* * *

"White grubs" and wireworms" feed below the surface of the ground; hence, cannot be poisoned. By fall plowing and cultivating or summer-fallowing infested land much can be done to control them.

* * *

We must know how an insect feeds in order to know how to deal with him. Some insects chew their food while others suck the juice from foliage, stalk or root. The sucking insects cannot be killed by spraying with poison.

* * *

Do not be afraid to kill "currant worms", "cabbage worms" with Paris green or arsenate of lead.

* * *

Kerosene emulsion is made up as follows:—Stock solution: 1 gallon soft water, ½ pound soap; 2 gallons kerosene. Thoroughly dissolve soap in boiling water and add kerosene and churn violently. Dilute with 5 parts of water.

* * *

Recember that Bordeaux mixture is not intended to kill insects but to control fungus diseases.

* * *

Except in the case of potato beetle, arsenate of lead in better than Paris green. Two or three pounds of arsenate of lead to 50 gallons of water, makes an effective mixture. Always use twice as much lime as Paris green in spray mixtures to prevent burning of foliage.

THE FARM AND FARM CROPS

SHAWVILLE SEED FAIR

THE annual Seed Fair of the Pontiac Agricultural Association No. 1, held at Shawville on March 16th was well attended by representative farmers of the district, many of whom had come from Calumet Island, Thorne and other distant points. The exhibits were not so numerous as in 1915, possibly due to various causes such as the unfavourable season for harvesting seed grain, more stringent rules, and changes in classification. However, considering the circumstances, the exhibit was a large one.

During the judging the farmers were allowed to ask questions regarding the placing of the different exhibits, and much interest was taken in this work, especially during the first few classes. This is one of the chief educational features of the Fair.

When the judging was completed, about 2.30 p.m., a meeting was held under the chairmanship of the President, Mr. William Hodgins. The judge, Mr. M. E. Honey of Abbotsford, spoke in very complimentary terms regarding many of the samples, and said he was pleased to note the entire absence of weed seeds in most of the grain he had judged. Mr. Honey acceded to a request to give a practical lesson on the judging of grain to one of the classes in the Shawville academy.

Mr. J. K. King, the local agricultural Demonstrator, gave a practical talk on purchasing and growing seed, and referred to the work he is endeavouring to do in the community along certain lines of co-operation, treatment of grain for smut, and the introduction of the silo on the farm. Many practical points were brought out in the discussion which followed the addresses.

The undersigned is pleased to report that many farmers use this fair as a medium for ascertaining where they may procure suitable seed grain. This is the chief purpose for which the fair is held.

In certain classes in which the entry was large, good seed was exhibited by certain parties whose names do not appear on the list of prizes. A complete list of exhibitors in any one class will be furnished any farmer on application.

A list of the awards follows. The association receives a special grant from the Quebec Department of Agriculture for the expenses of this Fair.

Award of Prizes

WHEAT (Red and White Fife) 1st, W. T. Barber; 2nd, Mrs. P. Dumas; 3rd, L. A. Smart; 4th, Percy Dagg.

SPRING WHEAT—1st, R. J. Wilson; 2nd, D. McDowell.

OATS (Banner)—1st, W. H. Corrigan; 2nd, Geo. E. Palmer; 3rd, Chester Walsh; 4th, E. J. Barber.

OATS (Other variety)—1st, R. J. Wilson; 2nd, Percy Dagg; 3rd, Walter Hodgins.

PEAS—1st, Anthony Armstrong; 2nd, J. B. Kilgour.

BEANS—1st, R. J. Wilson; 2nd, L. A. Smart; 3rd, D. McDowell; 4th, Hugh Young.

RED CLOVER—1st, Chester Walsh; 2nd, D. McDowell; 3rd, Mrs. P. Dumas.

BARLEY, 6-rowed—1st, J. C. Glenn; 2nd, W. T. Barber; 3rd, Percy Dagg.

CORN ON THE EAR—1st, T. McDowell; 2nd, Nellis Hodgins.

POTATOES, WHITE—1st, L. A. Smart; 2nd, D. McDowell; 3rd, Percy Dagg.

POTATOES, RED — 1st, L. A. Smart; 2nd, D. McDowell.

R. W. HODGINS,
Sec. C.P.A. S. No. 1

CANADIAN SEED GROWERS' ASSOCIATION SPRING CATALOGUE

THE annual Spring catalogue of the Canadian Seed Growers' Association containing a list of the offerings of "Registered" and "Improved" Seed by members of the Association, has just been distributed. The catalogue gives the names and addresses of the growers, the kinds of seed and the quantities they are offering, the price per bushel asked, the percentage germination, the certificate number and certain remarks re quality of sample. A description of some of the leading varieties is appended, as is also an outline of the work of the Association and the System which is followed in the production of "Registered Seed".

Farmers desiring to procure high class seed at a reasonable price should write the Secretary of the Association, Canadian Building, Ottawa, Ont. for a copy of the above publication.

SEED CORN

OBTAINING a satisfactory supply of seed corn is frequently a difficult problem for the ensilage corn grower in the East. Fortunately conditions are improving; but there is still a large quantity of poor material marketed and each season presents a new set of difficulties, in which connection the season of 1916 is a most outstanding one.

It need hardly be pointed out to the Eastern grower of ensilage corn that practically all of his seed supply is derived from the southwestern peninsula of Ontario—a district comprising some six counties and devoted very largely to seed corn production. During the harvest season of 1915 growers in this district were visited with the most unfavorable weather conditions that they have had for many years. Heavy rains occurred at frequent intervals causing increased stalk growth at the expense of proper maturity of the ear. As a direct result of these conditions much of the seed corn marketed this spring will undoubtedly be of low vitality due to poor maturity and in many cases to freezing. As indicating the reliability of this statement one of the largest corn dealers of that district has sent out with his annual catalogue the statement that never in the past twenty years has good seed corn been so scarce as it is this spring. As a result of these conditions the importance of early ordering of the seed corn supply cannot be too strongly emphasized.

Two important matters arise out of this situation demanding special comment. First of all a still greater necessity than ever of buying one's supply of seed *on the cob.* A much poorer grade of corn is almost invariably used for shelling purposes, and it will this year probably be particularly poor. This poor material is much more readily removed by discarding an ear than it is in a bulk lot of seed. Corn quickly loses its vitality when shelled and should remain on the ear until shortly before the grain is to be seeded. Only about 14% of the seed used in Quebec is purchased on the ear. Let this year be a lesson to growers to materially increase this percentage. The second matter of importance is that all seed corn whether in bulk or on the ear should be *tested for germination.* This practice, a necessity every year, becomes doubly so this year. Simple systems of conducting a germination test have been described previously in these columns so need not occupy space again; reference to the illustration will immediately recall the methods recommended. This inexpensive insurance should not be neglected in a year when the quality and vitality of corn is so doubtful as it is in 1916. If the general vitality of a sample proves low it should be met with a heavier rate of seeding when planting time comes to insure a good stand.

Standard Corn Varieties:—

Seed corn growers have always felt the need of a definite standard type on which to base their selections both for planting and for the sale of seed. Purchasers have been handicapped in a similar manner, finding that varieties which gave good results one year acted very differently the following year. This was particularly true of old varieties lacking any very definite breeding. To overcome this the Ontario Corn Growers' Association—an association of the growers—in conjunction with various agricultural officials interested in the seed trade, have standardized some of the most important varieties—seven in all, four dents —Wisconsin No. 7, Bailey, Golden Glow and White Cap Yellow Dent; and three flints—Longfellow, North Dakota and Compton's Early. The standards finally decided on are included herewith. This is a most decided step forward and insures to the purchaser a more uniform yearly product of these varieties than has obtained in the past.

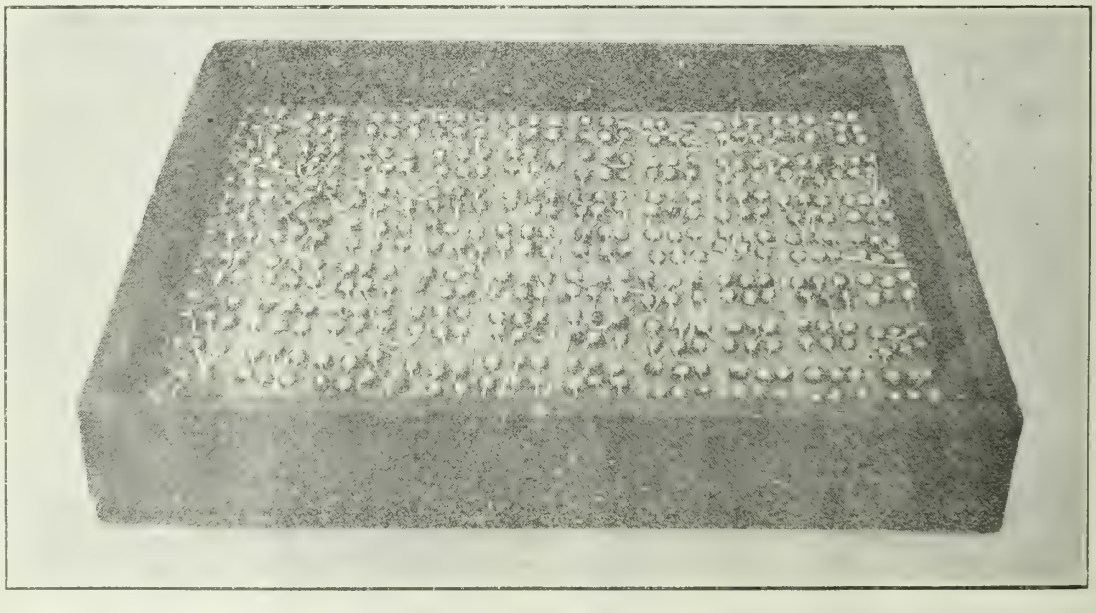


Fig. I. — Corn Germination Test Box.—Six kernels from each ear placed in square which bears the same number as the ear to be tested.

STANDARD VARIETIES OF ENSILAGE CORNS

Dents

(1) Wisconsin No. 7

Ear	Length	8½"-9½"
	Circumference	7"-7½"
Kernel	Color	Creamy White
	Indentation	Well Dented
	Rows	16-18
Butt	Moderately Rounded	
Tip	Well Covered. Fairly Full	
Cob	Color	Glistening White.

(2) Bailey.

Ear	Length	7¾"-8½"
	Circumference	6¾"-7¼"
Kernel	Color	Yellow Cap with reddish tinge lower
	Indentation	Nicely Dented
	Rows	16-18
Butt	Moderately Rounded	
Tip	Full. Well covered.	
Cob	Color	Dark Red

(3) White Cap Yellow Dent.

Ear	Length	7¾"-8½"
	Circumference	6⅜"-6⅞"
Kernel	Color	Cap White, remainder Yellow.
	Indentation	Fairly Rough
	Rows	14-16
Butt	Moderately Rounded	
Tip	Well Covered, slightly tapering	
Cob	Color	Red or White.

(4) Golden Glow.

Ear	Length	8¼"-9¼"
	Circumference	6½"-7"
Kernel	Color	Deep Yellow
	Indentation	Medium
	Rows	14-16
Butt	Moderately Rounded	
Tip	Slightly tapering	
Cob	Color	Cherry Red.

Flints

(1) Longfellow

Ear	Length	10½"-11½"
	Circumference	4½-5"
Kernel	Color	Deep Golden Yellow
	Indentation	None
	Rows	Eight
Butt	No larger than one-third distance up ear	
Tip	Slightly tapering and well covered	
Cob	Color	Pure White.

(2) Salzer's North Dakota.

Ear	Length	11"-12"
	Circumference	5"-5½"
Kernel	Color	Pearly White
	Indentation	None
	Rows	Eight
Butt	No larger than one-third distance up ear	
Tip	Slightly tapering and well covered	
Cob	Color	Pure White.

(3) Compton's Early.

Ear	Length	12"-13"
	Circumference	5½"-6"
Kernel	Color	Deep Golden Yellow
	Indentation	None
	Rows	Twelve
Butt	No larger than one-third distance up ear	
Tip	Well covered	
Cob	Color	Pure White.

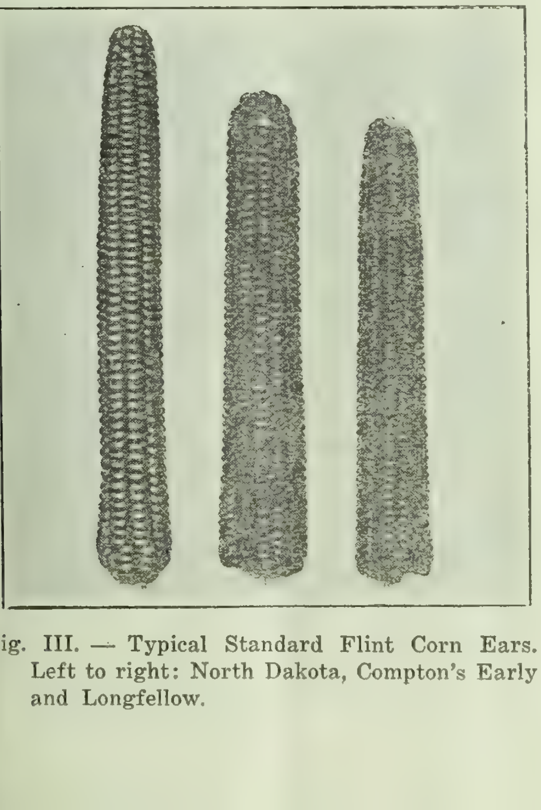


Fig. III. — Typical Standard Flint Corn Ears. Left to right: North Dakota, Compton's Early and Longfellow.

Ensilage growers in Quebec are strongly recommended to confine their purchases to two or at the most three of these seven standard varieties, buying the early or late varieties in accordance with the possibilities of the district in which they are located. Little definite information is yet available on the exact requirements of the various districts of western Quebec. However, experiments that have been conducted would seem to indicate that among the dents the Wisconsin No. 7 was somewhat large and late for same districts, notably the Townships, where such varieties as Golden Glow, Bailey or White Cap would be productive of better results. Among the flints the Compton's Early is decidedly the latest and in our experience a very poor quality of seed is supplied even when purchased on the ear. Between the other two flints Longfellow and North Dakota there is but little to choose, results being if anything in favor of the Longfellow.

Many other varieties of ensilage corns are commonly grown. Probably the most notable one in the East until very recently at least was the Leaming or Early Leaming and surprise may be expressed that this variety was not standardized even before some of the others. Comparatively few growers in the corn district are to-day producing Leaming seed corn, chiefly because the variety lacks definite breeding and is consequently less productive in seed corn than many others. Much of the corn shipped East during the past few years labeled as Leaming has really consisted of a mixture of two or more of from seven to eight varieties of yellow Dent corns. This fact, combined with the equally important consideration that the supply is very limited, makes one necessarily hesitate in recommending the general purchase of this so-called variety.

One other variety might be mentioned here as being particularly well adapted to sections having but a short season free from frost. The Northwestern Dent is a variety which is very generally grown throughout the Canadian West and is the earliest of all ensilage corn sorts. The yield of fodder is not excessive, though by no means small, but under our conditions at the College, at least a portion of the ears will ripen every year. In districts where one has to sacrifice tonnage to attain the proper degree of maturity for ensilage this variety should prove a valuable asset.

Seed Corn Control System:—

Purchasers of seed corn have, in the past, been working somewhat in the dark. The great majority of the trade represents a direct transfer from grower to purchaser, the latter having practically no guarantee or means of redress if the sample is otherwise than as represented. Under this system no premium, other than personal reputation, is placed on careful selection. This is not as it should be. Value given should be paid for in cash. Most ensilage growers will be willing to pay an advanced price if they are assured of corn of reliable quality.

To a certain extent the conditions outlined have been unavoidable. The natural extreme variation which we always have in a sample of corn, especially a dent corn, as compared with cereal grains or grass and clover seeds has made it very difficult to suggest any system of grading that would adequately meet the situation.

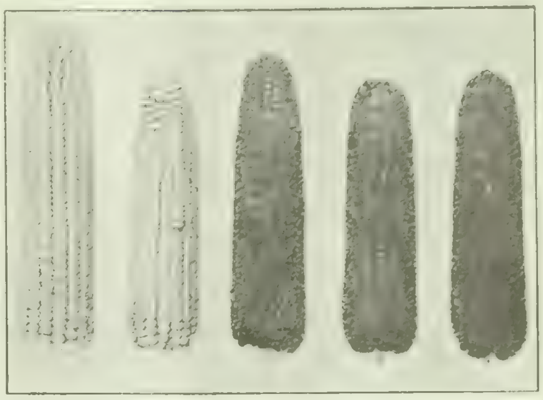


Fig. II. — Typical Dent Corn Ears. Left to right: Wis. No. 7, White Cap Yellow Dent, Leaming, Bailey and Golden Glow. All but Leaming standardized.

With the advent of standard varieties and a greater general interest in good seed corn, on the part of both the grower and the producer, it has seemed fitting that some more definite control measures should be taken. Accordingly the Seed Branch of the Dominion Department of Agriculture has devised and provided a series of corn grades viz. Ex. No. I; No. I & II. Briefly these are to consist of as follows:—

Ex. No. I:—To be of 95% typical ears, carefully selected and cured, and to germinate at least 95%.

No. I:—To be of 90% reasonably typical and uniform ears, well selected and to germinate, as least 90%.

No. II:—To be of 85% reasonably typical and sound ears and to germinate at least 80%.

Owing to the peculiar nature of the corn trade, where direct sales are made, the proper inspection and grading becomes extremely difficult. In this new method the Minister makes an agreement with the grower who will himself fix the grade. Once the corn is graded and shipped the grower becomes responsible and agrees that, should the grading be disputed by the purchaser, he will accept the decision of the Chief Seed Inspector as to the actual grade. In the event of this official giving the corn a lower grade the seller agrees either to have the shipment returned free of all cost to the purchaser or to accept the price of the grade assigned by the Inspector. This grading system is distinctly advantageous to the buyer and in future he should insist on having only corn which is sold to grade.

In conclusion, let me again emphasize the special necessity of looking early to the seed corn supply this spring; of always buying on the ear and testing them individually for germination; of growing only suitable standard varieties and of buying by definite grade to insure seed of good quality.

L. C. RAYMOND

SPRINGTIME HINTS

"To each season its work," might well be taken as a watchword by farmers. In few other industries does the seasonal factor count for so much as it does in agriculture. The farmer who neglects to sow his grain at the proper time is certain to be an unsuccessful farmer. Similarly, the farmer who fails to have the summer's supply of wood cut and piled during the winter season is very likely to be haphazard in all his work. Successful farming is based on orderliness. Each little piece of work on the farm falls to some one specific week of the fifty-two in the year. Failure to recognize that fact and to be governed accordingly, spells confusion and lowered efficiency—"To each season its work."

* * *

The notes that follow are little pointers that should help the farmer with his spring work. They are written by a practical farmer who has had wide experience in Canadian agriculture, and are merely little reminders of work that must be attended to in the spring.

* * *

Water-courses should be looked after, and furrows opened up, so as to let off the surplus water before the sun dries it up and bakes the soil. Well drained fields hasten seeding.

* * *

If heavy loam or clayey soils are worked when they are wet, they will bake and crack open when dry, and good crops need not be expected. When the soil is in a suitable condition, however, not an hour should be lost. Early seeding gives the best results.

* * *

Systematic crop rotation gives the best results. If it has not already been given a trial, apply it to a portion of the farm. The experiment will prove its value.

* * *

Sow grain and a heavy seeding of grasses and clovers on the land that was in hoed crops last season.

* * *

Plough up the old sod that has been down two or three years and sow corn or roots, or plant potatoes. A heavy seeding of peas will also give good results.

* * *

The new, heavy-seeded meadows will give heavier crops than the old ones. New thick-bottom pastures, two years down, will feed more cattle than old, thin, worn-out meadows.

* * *

Keep all animals out of the pastures during April. Stunted pastures mean stunted animals later on. Give the pastures a chance to make a fair growth during the early spring; then the stock will have something to feed on all summer.

* * *

Gather the loose stones on new meadows and roll the land as soon as it is fairly dry. Grain land should not be rolled until the grain is well up.

* * *

Clean up the rubbish that has collected around the farm buildings during the winter. Clean surroundings make the farm home much more attractive and healthy.

FIGURING LOSS FROM SMUT

A campaign demonstrating just how much damage is done by oat smut was thoroughly prosecuted in Peoria Co., Ill., last summer. County Agent *Henry Truitt* induced as many farmers as possible to treat their seed oats in the spring. As the oats were heading out he put up signs at many fields that were treated and others nearby that were not, stating these facts. It was also stated in bold letters that the treating cost only 2 cents an acre. Before oats were cut a series of field meetings were held in the various townships. The farmers examined the treated and untreated fields and made careful counts of the percentage of smutted plants. The significant result was that they found an average of scarcely ½ of 1 per cent lost by smut in the treated fields, while the average in untreated fields was 16.9 per cent. One field was found with 49.33 per cent of the crop destroyed by smut, and another with 44.25 per cent. These figures are the average of a number of counts in each field.

After comparing the different fields and methods of treatment it was decided that the most satisfactory way was to use 1 pint of formaldehyde to 20 gallons of water for 40 to 80 bushels of oats. Those farmers who did a thorough job of mixing the moistened oats obtained good results, whether they treated on the barn floor, in the bin or in a wagon box. The only cases of injuring the germinating power of the seed were on two farms where the treated oats were left tightly covered for from three to seven days. This work has been so widely watched and discussed in the county that practically all the oats may be treated for smut next spring.

Similar results in fighting oat smut have been presented before in these columns. When farmers come together to see what others have done, how they have done it, and the results, they are convinced as in no other way. The formaldehyde treatment for oat smut was discovered a number of years ago, but not until county agents took hold of it did farmers make much use of it.—*Breeders' Gazette.*

SEED GRAIN

BEFORE the spring work on the land is begun, all grain intended for seed should be carefully prepared. If no special fields for seed purposes were grown last summer, this season's requirements may be met by very careful recleaning of the main crop harvested last autumn. *One can never afford to sow weed seeds* and one can seldom afford to sow grain more or less mixed with other types. Generous use should be made of the fanning mill in order to bring the seed grain up to a high condition of plumpness and purity.

Whenever a farmer has the slightest doubt in regard to the vitality of his seed grain, he should have a test made.

While the seed laboratories of the Dominion Government are always available for farmers who desire to have an official report on their grain, anyone can make a test for himself without delay by placing about two hundred seeds between layers of blotting paper or cloth, and keeping them damp for a few days. An ordinary dinner plate is very handy for this purpose, with another plate set on it in reversed position.

The grain after being moistened must not be allowed to become dry, and must not be exposed to frost. After about six days the sprouts from the seeds of strongest vitality will be sufficiently developed. Seeds which take an unusually long time to sprout generally give weak plants. Even if the seed does not produce a large percentage of strong sprouts, it may be safely used for sowing. It is only necessary to sow such an increased quantity as will bring the strongly vital kernels up to the usual number per acre. If, however, the germination test shows scarcely any strong sprouts, the farmer should secure other seed.

Change of Seed.—There is no danger that any kind of grain which grows well on your farm will ever lose productiveness if it is given a fair chance. Practise a good rotation, cultivate the land thoroughly and sow clean, plump seed. If you follow this advice you will never need to change your seed unless some new and superior variety is being introduced.

New Varieties.—Never pay a high price for seed of a new variety unless it is recommended for your district by some specialist (in the employ of the Government or of some Agricultural College) who has no interest in the sale of the seed. You cannot afford to do much experimenting. The Dominion Experimental Farms will do that for you. If you wish to try a new sort, sow only a small area at first and compare the results carefully with your old variety.—*C. E. Saunders, Dominion Cerealist.*

SPRING WORK IN THE FIELDS

EARLY SPRING TILLAGE.—Do not allow the ploughed land to become dried out. Harrow or cultivate the soil as early as possible without puddling, and thus conserve moisture to help tide the crop over any period of drought. Further, early stirring of the soil makes earlier seeding possible, and any weed seeds which sprout are destroyed during the seeding operations. Working land while too wet puddles it; fine textured soils like clay are rendered compact and impervious to water and air, or in other words puddled, which is to say they lose that crumbly structure characteristic of a good seed-bed. The effects of puddling extend over a number of years and can be remedied only by the most judicious management. Good drainage, judicious ploughing, frequent manuring and in some cases liming serve as protection against this danger.

A USEFUL TILLAGE IMPLEMENT. — The double cutaway disc harrow is a machine which will pulverize the soil and prepare an ideal seedbed economically.

USING THE ROLLER.—Where it is required to use the roller to smooth or firm the surface after seeding, follow with the harrow, because a firm surface favours the rapid loss of soil-moisture by evaporation.

The roller should not be used on wet land, as the close packing excludes the air, and air is necessary for quick germination of the seed.

SEEDING AND PLANTING.—Test all seed for germination. Sow the grain as early as practicable. Grass and clover seedings should be heavy.

Sow mangels as early as you get the land into shape and use plenty of seed; sow turnips the last crop of all, but with as little delay as possible. If sowing in drills, make them as shallow as possible. The hand wheel-hoe, a tool especially suited for stirring the soil near the seed row when the plants are coming through, does not cost much and is almost invaluable.

When spring ploughing for corn, turn a rather flat shallow score—3 to 5 inches deep according to soil. Plant the corn as early in May as conditions will allow, but remember that corn requires much heat to stimulate quick germination of the seed.

Corn will grow on any well drained rich soil, but thorough cultivation is absolutely necessary.

Plant not less than 3 feet apart in hills, and in drills 3½ feet apart, thinning the plants in the drill to 9 inches apart.

Sow suitable early maturing varieties and purchase the seed on the cob.

Cultivate thoroughly throughout the growing season; — deeply in the fore part, shallower towards the end to avoid injuring the developing roots. The two-horse corn cultivator materially reduces the cost of cultivating.

W. L. Graham,

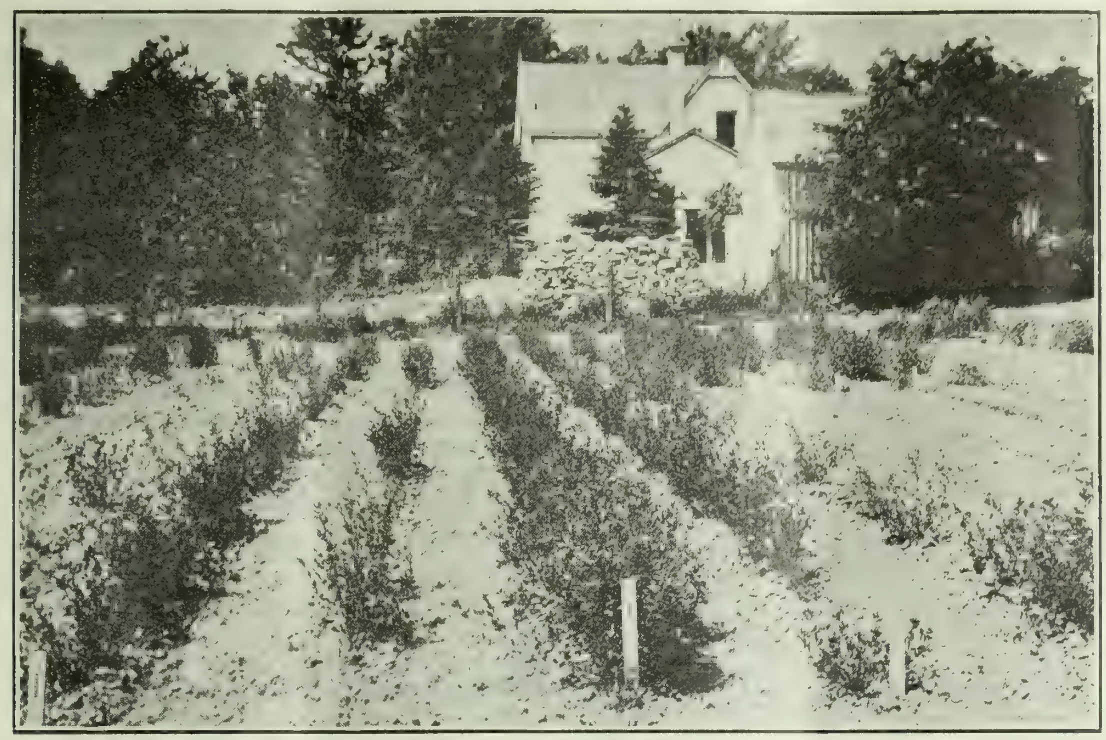
Dominion Experimental Farm

THE ALFALFA CROP

Choice of Soils and Varieties

AS a crop for hay, soiling and pasture alfalfa has been highly esteemed for several thousand years. Coming originally from the western part of Asia it rapidly spread through southern Europe and was introduced into South America and Mexico by the earliest spanish explorers. In North America it made its way from California where it was grown as early as 1850 to the central western states where irrigation is largely practised, and from there to every state in the Union and to every Canadian province. Over this wide territory it has earned and enjoys an enviable reputation as a forage crop, one not surpassed even by the great American crop-corn.

This reputation has been built up slowly on a solid basis of accomplishment. It was in the irrigated regions of the western states that on this continent it first became prominent. Its adaptability to the soils, its long life, its ready response to



Showing the winter killing of tender alfalfas and a hardy variety—Grimm.

applications of water with a bountiful return of from three to five crops of hay per year established it in first place as a crop for irrigated regions. That place it still holds secure not only in the United States but in western Canada as well. For lands not irrigated it has been found during the last twenty five years to be almost equally well adapted.

The particular qualities that give it pre-eminence as a forage crop on the ordinary farm are its abundant yield, the palatability and feeding value of the fodder for all kinds of farm animals, its long life, and its beneficial effect on the soil. In yield per acre it easily stands first among hay crops as it will generally produce two good crops per season and quite occasionally three crops. The actual yield of cured hay per acre at Macdonald College has been over 4 tons per acre in an average of seven years, while the highest yielding grass crop has been barely half as much. Even if the alfalfa were, compared with the grass, of somewhat less value for feeding ton for ton the difference in yield would more than compensate, but instead of being of less value it is decidedly superior so that there can be no possible doubt of the comparative food value per acre from the two crops. For dairy cows alfalfa is particularly valuable either for soiling purposes or for hay as it is high in protein, and for sheep or hogs no other hay is of equal value or as greatly relished. Horses are very fond of it and except for those at fast work it is a valuable food.

The effect of the alfalfa crop on the soil is worthy of note. Like other legumes it has the power of utilizing in its growth the free nitrogen of the air and by storing it up in its extensive root system, of adding fertility to the soil. The roots too have the effect of opening up the soil, and by their decay rendering it friable and easily worked. No other farm crop when plowed up leaves the land in such good condition for a crop of grain, roots or potatoes as alfalfa, and phenomenal yields of such crops have been recorded.

But in spite of these excellent and undisputed qualities of alfalfa it has still to win its way in this province. A few thrifty fields may be found either where natural conditions have specially favored its growth or where particular care has been taken in establishing it, but it cannot be said to occupy at present a place of importance among the farm crops of Quebec. This condition cannot be attributed to its never having been tried as Quebec farmers have undoubtedly sown tons of alfalfa seed in the last fifteen years. Everywhere in the province one finds men who have tried it from time to time, but few have favourable reports to make. The reasons for these failures we propose to discuss briefly and to point out how they may be overcome.

Of primary importance in the growing of alfalfa is the *selection of soil* and if this be neglected all other precautions are futile. In the western part of the continent where alfalfa for forty years has been an important crop it has always seemed to thrive on all soils alike provided only it had a supply of water; but as it worked its way east to lands that have been longer under cultivation and where a heavier rainfall prevailed it appeared to be more discriminating. Successful stands were more commonly secured on gravelly uplands, well drained but with a sufficient supply of water available, and failures were more frequent in heavy clays or clay loams. In Ontario twenty years ago when alfalfa was being extensively tried out growers were recommended to avoid the rich clay loams and clays and to favor the uplands with a sprinkling of gravel. For years most of the alfalfa in Ontario was grown on that kind of soil but now it is being grown successfully on every kind from a heavy clay to light sand. This change of practice has been brought about by an appreciation of why it succeeded so well on the soils of a gravelly nature and by creating the same conditions on the other soils by *draining them and adding lime.*

Quebec soils are very generally deficient in lime and in this we have one of the main reasons why alfalfa has so often been a failure. Some of our soils never were rich in this constituent while others were largely of limestone origin, but cultivation for a period of from fifty to one hundred and fifty years has largely depleted even an abundant supply. We find in consequence through a deficiency of lime many *acid* or *sour* soils. In all such soils alfalfa positively refuses to thrive.

The need of lime and the benefit to be derived from its use was clearly demonstrated on a number of plots observed in the province last summer. On one farm near Richmond about half an acre of alfalfa had been sown early in June and the winter's accumulation of hardwood ashes had been scattered over about two thirds of the area. When this piece was seen early in July the alfalfa on the part receiving the ashes was about six inches high, of good color and generally thrifty in appearance. On the balance the plants were not more than two inches high of a sickly yellow color and looked as though they would be dead in the course of ten days. The land had been cultivated and cropped in exactly the same way for years and all the alfalfa seed had been sown at the same time. The healthy vigor of the plot receiving the ashes was undoubtedly due to the lime in the ashes. Another similar case was observed at the Lennoxville Experimental Station. A number of plots were sown last spring and when seen in July all had made a growth of about a foot and appeared vigorous and thrifty. In the early part of September they were again examined. In the meantime a marked change had taken place in the appearance of all of the plots but one, which still appeared as healthy as before. The others were shorter, of a pale green color and evidently unhealthy from some cause. On making inquiry it was found that only one plot had received lime before the seed was sown. In this case the soil had evidently been unusually fertile and a strong growth had been promoted early in the season, but the lack of lime ultimately had its effect.

On many other farms where alfalfa had been sown the prevalence of Sheep Sorrel (Rumex acetosella) and Spurrey (Spergula arvensis) indicated that the soil was sour, and the appearance of the alfalfa bore similar testimony.

The first step toward establishing the alfalfa crop is the correction of the deficiency of lime in the soil and this may be done either by the application of ground limestone, quick lime, or slacked lime. If ground limestone is used it should be pulverized so that it will pass a screen with ten meshes to the inch. There is no objection to using a more finely ground product except that it is more expensive. The amount to use per acre will vary with different soils but it would seldom be wise to apply less than two tons and a heavier application up to four tons would often be advisable. The effect of the heavier applications is more lasting and under most conditions should extend over from six to ten years. If quick lime is used one to two tons per acre would be sufficient. In whatever form the lime is applied it should be well incorporated into the soil and as the ground limestone is slower in its action than the lime it is advisable to apply it either very early in the spring or the fall previous to sowing. Which to use will depend largely on the price. If it has to be shipped a long distance by rail the lime will probably have the advantage as smaller applications are necessary. The ground limestone on the other hand is pleasanter to handle and is more permanent in its effect.

In addition to having an abundance of lime in the soil it is essential that it be well *drained.* Alfalfa is a deep rooted plant, and while it requires abundance of water to produce heavy crops its roots will not penetrate into soil in which there is standing water. The water table in a field for allalfa should not be closer to the surface than three feet, and if it is four or six feet so much the better. Surface drainage is of almost equal importance as the formation of ice in the winter on low spots in a field is very often fatal. A field should be chosen, therefore, free from large pockets in which ice is apt to form.

CHOICE OF VARIETY

While the intelligent selection and treatment of soil is everywhere an essential to successful alfalfa growing the selection of variety in this province is of no less importance. The use of a tender variety even under good soil conditions is just as certain to lead to failure as is sowing on sour or undrained soil. The true alfalfa is a native of warm climates and but poorly fitted to stand the rigors of a Quebec winter. Most of that grown in the United States found its way to that country from Spain by way of Mexico, and while it succeeds admirably in the central western states and even in the semi-arid states of Wyoming, Nebraska, Colorado and Utah, it is but poorly adapted to our conditions. As most of the seed sold in Canada is of United States origin a large proportion of it produces crops that are too tender to survive in this climate. Fortunately, however, we are not wholly dependent on such seed, and there are varieties obtainable that have given excellent results in this province under the most trying conditions.

In the trial plots at Macdonald College over one hundred varieties and strains have been tested for five years. These were obtained from all parts of America and Europe and a few were of Asiatic origin, and included samples of all kinds obtainable commercially in Canada. Out of all the varieties tested less than half a dozen have proven suitable for Quebec conditions. Of the others many have been killed outright and the balance have suffered a loss from winter killing of from fifty to ninety per cent. The varieties that have survived with practically no loss and which are obtainable commercially are Grimm, Ontario Variegated and Baltic. These are known as Variegated alfalfas (Medicago Media) and are supposed to be natural hybrids between the true alfalfa and a hardy, yellow, blossomed type that is native of Northern Europe and Asia. The hardiness is evidently inherited from the northern parent.

Of the three varieties mentioned Grimm is the best known. It was introduced into Canada from northern Minnesota where it has been successfully grown for over sixty years. Within the last fifteen years it has been extensively tried in all the northern states and in western Canada, and wherever it has been sown it has proven to be the hardiest variety obtainable. At Indian Head, Sask. it has been producing good crops for ten years and promises to live many years yet. At Guelph, Ontario, also it has proven to be hardier than any other variety. It has such a uniformly good record wherever tried that we do not hesitate to recommend it as the best obtainable for Quebec conditions. The other two varieties mentioned are very similar to Grimm and may be used with confidence.

The only objection that can be raised to the purchase of seed of these hardy varieties is that it is more expensive than that of the ordinary kind, but it must be admited that it is a much wiser policy to buy at a high price a variety known to be trustworthy than to throw money away on one that is sure to give disappointing results. A few pounds of seed is sufficient to sow half an acre and this area will demonstrate the value of the crop just as effectively as a larger area. Once alfalfa has had a fair chance to do this it will henceforth win its own way.

JAMES MURRAY,

Macdonald College

LIVE STOCK

WATER, AIR AND FOOD AS FACTORS IN DISEASE

The importance of hygienic conditions for domestic animals becomes more and more apparent, and while a certain amount of appreciation of this fact is manifested, the improvement in the average stable has not been as great as the importance of health would justify.

To deal with the principal factors, water, air and food, we must consider them separately to treat them in anything like a satisfactory manner. The part played by water in the production of disease has only within comparatively recent years received the attention it merits. It has been clearly proved that people cannot drink with impunity polluted waters and a great deal of our present sanitary legislation has been directed to the supply of pure water for our towns and cities. Compare this with the attention that is given to the drinking water of domestic animals, where so often no precaution whatever is taken. Many a herd is allowed to drink water from the most convenient source regardless of whether it contains faecal material or sewage without any consideration for the health of the animals.

Among domestic animals there are few diseases that can be spread by water as in the human family, for example, typhoid and cholera, where water systems have become infected with the causing germ. But the local supply can become contaminated by coming in direct contact with infective material, as at the public watering troughs where some horse suffering from strangles or glanders has left, while drinking, a small amount of saliva laden with disease-causing germs, and thus rendering the water a source of infection.

Among the chief diseases attributed to impure water are cerebrospinal meningitis, dysentery and enteritis. Although we have few diseases directly caused by impure water the matter should be looked at in a broader light. Experience teaches us that the highest degree of health is only obtained when we have pure water, and when this is not so it is attended if not by disease certainly by loss of physical fitness, and this loss is more particularly seen among the heavy working class of horses. Anything which detracts from the highest degree of health renders the animal more prone to and a better subject for disease.

The source of water supply should be such that there is no possible chance of any surface or sewage contamination as this has a strong tendency to produce diarrhea, which is an unnecessary wasting of the animals' vitality.

In the case of milch cows having access to a contaminated supply, a shrinkage in milk is noted, and again objectionable odors and taints have been directly attributed to a bad water supply.

On the outbreak of any contagious disease in a stable the water supply should be one of the first things noted, and if there is any suspicion of it as a probable cause, a careful general examination of surroundings should be made together with a sample which should be forwarded to any of the Colleges or Agricultural Stations for further bacteriological examination. While awaiting results it would be advisable to discontinue the use of the water when possible.

Our object in bettering the hygienic conditions of animals is to secure the greatest degree of bodily health, for in this condition the animal is better fitted for work or for human food, and is less liable to disease.

The popular impression inferring that any water supply is good enough for domestic animals is most unfortunate, and is in urgent need of correction.

It is scarcely necessary to dwell upon the all-importance of air. We have only to remember that it is a regular and urgent necessity. Food and water can be done without for hours or even days, but a few seconds' deprivation of air brings about an alarming change in the animal body. Nor is this change difficult to understand when we consider that the process of building up and destruction is constantly going on in the body and that nothing must interfere with the necessary supply of oxygen nor the removal of waste materials. Consider the changes that take place in the blood during respiration. The inspired air is brought so intimately in contact with the blood of the body that only a thin membrane of extra thinness and delicacy separates the two. Through this membrane the blood absorbs oxygen and gives off carbonic acid and impurities. Note then the influence on the blood when instead of coming in contact with pure air, it comes in contact with impure air. No oxygen can be taken into the system nor can any impurities be given off. During the ordinary course of affairs we do not get such extreme conditions, but by the continual deficiency of oxygen in the inspired air we reduce the strength and vigor of the animal's body, making him more prone to, and less able to withstand the trials of disease.

To impress the reader with the extreme importance of pure air, I will quote a few statistics from a French Government Report.

This Government has for some time been housing its horses in open sheds with canvas sides in preference to the old time closed stables, and the result was as follows:—

Number of cases per 1000 for 1 year.

	Closed Stables	Open Sheds
Glanders	24	7
Pneumonia	104	4

With glanders the reduction was not as great as might be expected, but we are always liable to have some glandered animal showing no clinical manifestation of the disease but carrying the causative germ, while in pneumonia the results are marvellous and show conclusively the necessity of pure air in the prevention of disease.

This fresh air treatment will work out in all respiratory troubles and it is almost impossible to successfully treat any animal suffering from these unless we can supply him with an abundance of pure air.

In the human family those suffering from pulmonary tuberculosis are kept in the open air as much as possible and marvellous results are obtained from such treatment, while if domestic animals were kept under conditions where they had an abundance of pure air, instead of cold, damp, draughty, poorly ventilated stables, tuberculosis and respiratory troubles could be reduced to a minimum.

Feeding in relation to agriculture is of great importance to the owner. It has been repeatedly pointed out that the problem of stock management largely resolves itself into a question of successful feeding. It is not sufficient to know that certain foods possess highly nutritive qualities and that others are practically worthless, but the economic value and the use of foods indicated for the varying conditions of animals must be clearly understood.

While considering the feeding of horses the object aimed at is to obtain the maximum amount of energy at a low cost; with sheep, cattle and hogs the question is not the production of energy but the accumulation of flesh, the growth of wool, or the production of milk.

Dieting as dealt with in the human family is simplified by the fact that one system of digestive organs must be considered, while in the case of domestic animals the matter is entirely different, since we have at least three distinct digestive tracts, consequently proper feeding practice for one may not be suited for the others. For instance, the feeding of cattle differs materially from the feeding of horses and the feeding of swine is unlike that of either horses or cattle.

The animal may be considered as a machine out of which it is desired to obtain the greatest amount of work or flesh at the smallest expense and the least amount of wear and tear. To do this the food must meet several requirements; it must be palatable, wholesome, abundant, nutritious, clean, sweet and of good economic value. Regular hours of feeding, cleanliness in preparation and suiting the individual requirements are factors of importance. The feeding of horses is determined by the nature of their work. Severe rapid labour cannot be performed on a full stomach, because the interference with digestion and respiration is likely to occasion disease.

On account of the horse having a small stomach he should be fed often and in small quantities. His water requirement is large and because of his limited capacity, together with its effect on the stomach contents, the water should always precede food. Therefore, water before feeding.

The general inability of an animal to vomit is in itself a warning to us of the grave danger to which the animal is exposed should stomach derangements occur. For example, in cases of acute indigestion or bloat in ox no relief of the organ is possible by vomiting.

The remarkable sympathy existing between the digestive organs, skin, feet, nerves, and lymphatic system, is often the explanation of why many diseases of an apparently opposite character are dependent on the food supply. In this connection may be mentioned broken wind, founder, weed, azoturia, diarrhoea and brain troubles, all of which can frequently be traced to digestive disorders.

Regularity in feeding and regular but not excessive work are the two chief safeguards against diabetic diseases. Horses should be fed three or four times per day, and the bulk of hay ration should be reserved for the evening meal. Sudden change of diet should be avoided. Animals on going to grass should be gradually accustomed to their feed. New hay or oats, roots or ensilage, when fed, should be gradually introduced and some time occupied in bringing them to their full ration. Such practice is the best preventive measure in all digestive troubles.

The week-end idleness is often a pitfall for the health of the working horse. Such animals should receive a bran mash instead of their grain ration on Saturday night and this diet with hay might well be continued till the evening feed on Sunday night. Azoturia and Weed will seldom occur when the holiday feeding is managed in this way.

Care should be taken of the teeth, they should be examined at least once a year by one who is capable of removing the sharp points, as this is very often the cause of an animal's unthrifty condition. While these points are present the food is not properly masticated and therefore the stomach and intestines are over-worked.

In special cases it may be of advantage to feed crushed or ground grains, but under general conditions the horse is well adapted for taking his food in the whole or ordinary way. It is highly important to avoid decomposed or soiled food of any sort, as this is a serious source of trouble, and not infrequently fatal diseases are attributed to the feeding of musty or mouldy hay, grain or ensilage.

In conclusion I would strictly recommend that an animal on recovering from disease should have its food allowance gradually increased and that it be exercised, so that when it returns to its normal duties it will be able to withstand the strain. Many a good recovery has been spoiled by thoughtlessness in allowing an animal, although appearing perfectly well, to suddenly go back to full rations and hard work.

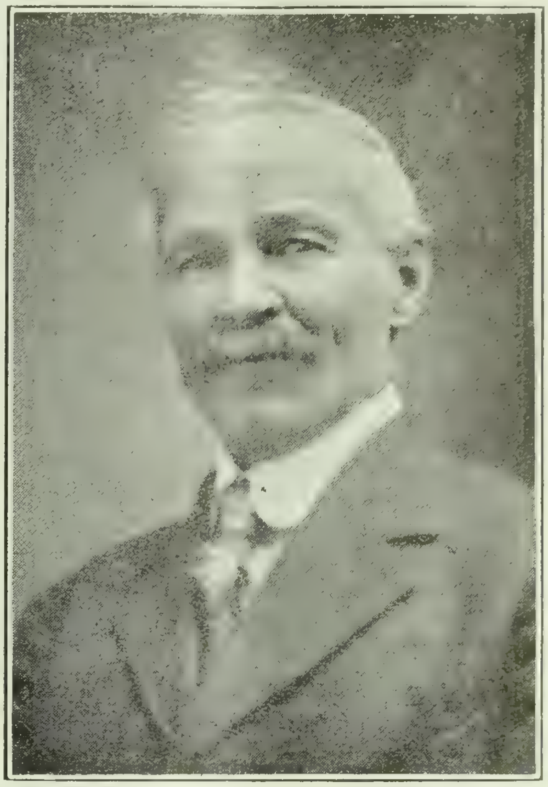
N. E. McEWEN, B.V. Sc.,
Macdonald College

MR. STE MARIE OF COMPTON

President of the Canadian Ayrshire Breeders' Association

MR. St. Marie, who was honored with this position by his fellow breeders at the last annual meeting in Toronto, was born in 1860 at St. Hubert, Chambly Co. in the Province of Quebec. He is a true son of the soil.

He has one of the best farms in Compton County and is most progressive in his farm methods. In 1906 he secured several head of Ayrshires as a nucleus, and has built up a herd of 60 or more registered Ayrshires which are a credit to the farm and to the breed, being large in size, of good type and big producers. A number of the females have qualified in the R. O. P. test and a number are prize winners. "Vaudreuil Pioneer"—40486—(Imp.) now heads the herd.



M. St. Marie, Compton, Que. President, Canadian Ayrshire Breeders' Association.

Mr. St. Marie was elected a Director of the Ayrshire Association in 1913 and has proved a valuable member of the Board. That he has good executive ability has been proved not only in the Ayrshire Association but in local affairs as well, as he has held several important positions in the County, not the least of which is Director of the County Agricultural Society. He has a son in Agriculture '16 at Macdonald College. The influence of such men as Mr. St. Marie is doing much to raise the standard of agriculture and live stock breeding in the good old Province of Quebec.

W. F. S.

GENERAL BREEDERS' ASSOCIATION OF THE PROVINCE OF QUEBEC

Annual Meeting held February 8th

THE General Breeders' Association of the Province of Quebec held its twenty second annual meeting on February 8th at the Queen's Hotel, Montreal. Among those present were the Hon. J. E. Caron, Minister of Agriculture for Quebec, Senator Owens, Messrs M.L.J. Tarte, George Morrisset representing the Quebec Exhibition, Mr. S. E. Francis representing the Sherbrooke Exhibition, Messrs O. E. Dalaire and A. G. Lambert of the Quebec Department of Agriculture, Messrs J. B. A. Trudel and J. A. Simard of the Dominion Department of Agriculture, Mr. J. Pasquet of the Ste. Anne de la Pocatière School of Agriculture, and Professor H. Barton of Macdonald College. The Hon. Martin Burrell had hoped to be present but was prevented by the grave accident which occurred to him on the occasion of the burning of the Parliament Building. The Hon. N. Garneau presided and Dr. Couture acted as secretary.

After congratulating those present upon the wide-spread interest evidenced by so large an attendance, Mr. Garneau referred to the modest beginnings of the Association, which he had helped to organize. For the first ten years the annual meetings comprised only a handful and the difficulty was to find a room small enough for the meetings. At the present rate of progress the difficulty would soon be to find a room large enough. Founded with about 40 members, the Association now numbered nearly 900, and in two years would no doubt pass the thousand mark. Was not this a success of which we had a right to be proud?

Mr. Garneau briefly reviewed the history of the Association. For the first ten years its prospects were doubtful but in 1905 a great impulse was given to its progress by the centralisation of herd book records effected by the Hon. Mr. Fisher. The institution of the annual sales had given a second and still greater stimulus to the growth of the Association. Since the second sale the membership of the Association had doubled and at present we could safely say that its future was assured, partly because of its numerical strength and still more because of the favourable attitude of the public powers. The Quebec Government recognized its importance, appreciated its efforts, and was affording it more and more generous aid in its annual sales. In Dr. J. G. Rutherford, Live Stock Commissioner at Ottawa from 1900 to 1913, the Association had a devoted and broad-minded friend, who more than any other had contributed to the winning of the confidence of the Minister of Agriculture of that day. Mr. Garneau referred to the numerous matters that were to come before the meeting and invited frank and free discussion of them all.

The Secretary's report showed a total membership of 878 members, distributed among the affiliated societies as follows:—

French Canadian Cattle Breeders' Association	192
French Canadian Horse Breeders' Association	200
Sheep Breeders' Association	251
Swine Breeders' Association	235
	878

The receipts for the past year had totalled $3,823.04 and the expenditure $1,873.46, leaving a balance in the bank on December 31st of $1,949.56.

The registrations for the year were as follows: Swine, 2103; sheep, 1599; French Canadian cattle, 319; French Canadian horses, 85.

At its sixth annual sale, held at Montreal on October 13th and at Quebec on October 20th, 395 animals had been sold, including 111 head of cattle (63 Ayrshires, 33 French Canadians and 15 Holsteins), 147 sheep and 137 swine. The deficit of about $4,000 had been assumed by the Quebec Government.

The Province of Quebec was not so backward in stock breeding as some would have it believed. In the breeding of Ayrshires it occupied the first place, in that of Holsteins the second. It furnished more members to the Sheep Breeders' Association than all the other provinces, Ontario included, and to the Swine Breeders' Association almost as many as Ontario. The fact was that in the last ten years Quebec has made great progress in breeding and if this progress continued for a few years, Ontario would be left behind. And this will be due to the General Breeders' Association.

A lengthy discussion upon the report ensued, having particular reference to the annual sales. It terminated in a motion to change the buyers of the Association, which was lost by a vote of two to one.

Resolutions were adopted: 1. Recommending the organization of a winter fair at Quebec and asking the Quebec Government to grant a subsidy for that purpose.

2. Asking the Minister of Agriculture to amend the law against dogs, the meeting being unanimously of the opinion that the present law was inefficient and that sheep breeding was greatly hampered by the depredations of dogs.

3. Asking for a law prohibiting the importation of stallions affected with hereditary defects.

4. Asking the Ottawa Department of Agriculture to inspect all swine sent to the great exhibitions upon the first day of such exhibitions so as to prevent the dissemination of hog cholera.

5. Recommending the establishment of a monthly review to promote the interests of the animal industry in this province.

The following officers were elected for 1916:—

President, Hon. H. Garneau; *Vice-Presidents*, Arsène Denis and James Bryson; *Secretary*, Dr. J. A. Couture; *Directors*, Jos. Deland, representing the French Canadian Horse Breeders' Association; Ged. Garceau, representing the French Canadian Cattle Breeders' Association; Napoleon Lachapelle, representing the Sheep Breeders' Association; and Louis Lavallée, representing the Swine Breeders' Association.

In the evening the affiliated societies met separately and elected officers as follows:—

French-Canadian Cattle Breeders' Association.—*President*, Arsène Denis; *Vice-president*, Ged. Garceau; *Secretary*, Dr. J. A. Couture; *Directors*, Hon. N. Garneau, Jos. Coulombe, Ls. Thouin, O. E. Dalaire, Pierre Sylvestre, J. P. Brodeur.

French-Canadian Horse Breeders' Association.—*President*, Joseph Deland; *Vice-president*, Victor Sylvestre; *Secretary*, Dr. J. A. Couture; *Directors*, Ls. Lavallée, Arsène Denis, Dr. J. H. Vigneau, Frs. Manceau, Ls. P. Sylvestre, Horace Morin, James Bryson, Camille Perreault.

Sheep-Breeders' Association.—*President*, Napoleon Lachapelle, *Vice-presidents*, James Bryson, J. E. Dion; *Secretary*, Dr. J. A. Couture; *Directors*, Arsène Denis, V. Sylvestre, Pierre Sylvestre, E. H. Morgan, Uld. Legris, Ant. Phaneuf, J. A. Lavallée, Jos. Forget, Edm. Provencher, Julien Charlebois, Jos. Couture, Dr. Forest.

Swine-Breeders' Association. — *President*, Ls. Lavallée; *Vice-presidents*, Clovis Ouimet, F. Byrne; *Secretary*, Dr. J. A. Couture; *Directors*, M. Geo. Hooker, Alf. Gingras, Theo. Trudel, Ls. Thouin, Ovide Loiselle, Geo. Laliberté, Z. Riendeau, Art. Fournier, Armand Denis.

AYRSHIRE HEIFERS FOR CALIFORNIA

On Friday, Feb. 18th, 1916, Gilbert McMillan of Trout River, Que., shipped 31 head of two year old heifers from Huntingdon. They were comfortably stabled in a big express car, and consigned to E.B. Mcfarland, "Steybrae Farm", San Mateo, (near San Francisco) Cal. Mr. Mcfarland and brother came in person to select this number from an aggregation of 35 heifers, got together by Mr. McMillan, and to care for the cattle during their long overland journey, which was expected to take 5 or 6 days. Mr. McMillan contributed two heifers to the consignment and selected from other breeders as follows:—

R. R. Ness, 5, D. T. Ness, 4, Hector Gordon, 4, all of Howick, Que.; James Davidson, Waterloo, Que. 7; A. W. Tannahill, Kelso, Que. 2; J. E. White, Trout River, Que. 1; Jas. T. Elder, Glenelm, Que. 1; Jas. J. Cavers, Ormstown, Que. 2; D. A. Macfarlane, Kelso, Que. 3.

Mr. McMillan selected the heifers from these herds and assembled them at "Springburn", where they were held for some time in conformity with the United States regulations.

They were mainly from imported bulls, three being from Hobsland Masterpiece, 4 from Finlaystone San Toy, 3 from Holehouse White Heather, 7 from White Prince of Ayrmont, 1 from Morton Mains Arbeth, (half brother to Peter Pan) 1 from Auchenbrain Perkins, 2 from Lessnessock Scottish Thistle, 1 from Barcheskie Rosedale. All of them were from big roomy cows, several of which are in the Record of Performance.

They were one of the most uniform and typical consignments that has left this district for some time. The majority of them were bred to sons of "Hobsland Masterpiece".

Mr. Mcfarland stated that the Ayrshire cow was becoming very popular in the Pacific Coast States.

W.F.S.

THE TREATMENT OF THE MARE IN FOAL

The spring season is of unusual concern to the owner of pregnant mares. It brings the foaling season and the cares which associate themselves with the proper care of the mother during this critical period and afterwards. As the demand for market horses steadily increases more breeders are adopting this line of stock-raising and it is to their benefit to take special care of this initial stage that they may make a success and build up a profit-paying business.

The mortality among both mares and foals in the country at large is much greater than it ought to be and, while in some cases it is unavoidable, in a great many cases it is due to the ignorance or carelessness of the owner.

The first consideration is the work for which the mare should be used. Many breeders are of the opinion that as long as a week or two is allowed at foaling time the mare can justly take her share of the work during the rest of the year. No mare can be expected to work at the usual horse labour during the full year and at the same time develop and rear a colt that will be a source of profit to the owner. The mare that is expected to be a source of profit by the colts she raises should be spared from the rough duties of the farm while pregnant and after foaling for the first time. If this is not possible it would be for the best interests of the horse market and the breeder to postpone the breeding until such a time is afforded, when the mare can perform the maternal duties under less strain and rough usuage. In this reasonable way many abortions and premature births would be lessened, to say little of the malformations that would be avoided, which are often induced while the colt is carried.

To say that the mare must not be used in rough labor is not saying that she should be used as an animal without labour value. The system of keeping mares entirely from work, which is keeping them from healthful exercise, is to be strongly condemned, as is its opposite.

Weak foals are often due to the mistaken kindness of the owner who never allows the mare to receive the proper exercise necessary to keep the system in an active condition. Usually as an accompaniment of *no exercise* there is *high feeding.* Through this combination the mare becomes overfat and lacks the vitality of a thrifty animal. The conditions of the maternal body have direct influence upon the foetus, and when it is born disappointment will be evident where favorable results were anticipated.

Then a combination of the extremes in giving the mare work is to be avoided. Often we find that she is used during the autumn season with little or no regard for her pregnant state, then stabled and allowed to stand on the regular horse fare for an indefinite time, unless needed to do the winter hauling. In the spring she is again used until the last stages of pregnancy or the signs of approaching parturition intercede for her relief. Under these conditions she is developing a foetus against irregularities that will mark their effect on the condition, development, or conformation of her production.

The course to be followed is one which gives steady light work to the brood mare. This can be used with benefit both to the mare and offspring. During the first few months of pregnancy the ordinary farm labor that is not exhaustive will not be injurious, but during winter and spring the work should be given with a view to healthful exercise rather than to anything else. Light work may even be given to within a few days of foaling, without fear of injury, but in case of this not being available, exercise should be provided by turning the mare loose in a yard for a few hours each day.

The stable room allowed should be a roomy, clean, box stall, with sufficient light and fresh air, and if possible this should be in connection with a sheltered yard, where the mare can be allowed to take exercise each day, when no work is provided. The practice of keeping the mare tied in a close narrow stall is to condemned, as it does not allow the free and easy movement that is possible when she is at liberty in a box.

The yard might be used to provide exercise for the growing colts or other animals when not being used by the mare, thus making it useful for more than one purpose.

An average supply of 12 to 15 lbs. of clean mixed timothy and clover hay with 6 to 10 lbs. of bran and oats mixed (as 1 of bran to 2 of oats by weight) will be sufficient as a daily ration. The quantities fed should be adjusted according to the size and condition of the mare. Mashes of bran may be fed as the evening grain meal, if the slightest signs of constipation are common in the mare, otherwise, the bran fed in the oats will keep the bowels in working condition, which is necessary if the health of the body is to be maintained. Four to seven pounds of roots per day will have this effect and are preferred by many breeders to feeding soft mashes. Feeds of a decidedly laxative nature are to be avoided. These will produce a marked relaxing of the body muscles and there is a tendency to abort if any influence should arise. Then, a ration that is dry and heating will cause constipation and a sluggish working of the system which will affect the development of the foetus. Such a food as corn-stocks or anything that is of a coarse and bulky nature should be avoided, also all sour, musty or tainted foods that are liable to arouse indigestion and like troubles.

As parturition approaches more attention should be paid to the reliability of the foods and the regularity of feeding than ever before. Sudden changes, ice cold water and physics must be put aside at the approach of this critical period. Close watch should be kept so that assistance can be furnished if required. The usual symptoms taken to indicate the approach of parturition are the relaxing and sinking of the hip muscles, a full udder, drops of milk on the end of the teats and the usual uneasiness which signals the approach of labour pains.

W. J. REID

FRESH AIR AND EXERCISE FOR BROOD SOWS

As everyone knows, sleeping balconies for humans have become very common during the last few years, and no doubt have been useful in promoting good health. We are told that the human anatomy is quite similar in many respects to that of the hog; at any rate the resemblance in character is often remarkable. The *genus sus*, or hog, in its wild state is a hustler, and gives birth to much stronger offspring than our over-coddled domestic swine, so it is not surprising that when we return, in a measure, to the more natural conditions of life the results in the case of brood sows are most satisfactory.

For many years our practice has been to keep our pigs at pasture as much as possible, except during the fattening period. We have one little grass paddock which is used at any time after the snow has disappeared in the spring, and another field close by where rape and other forage crops are sown. There are of course fairly tight sheds on high dry ground which act as sleeping quarters and shelter from storms. Last fall our pens were crowded with early August pigs which we were forcing along as fast as possible in order to get rid of them before Christmas. The three brood sows and boar had the run of the rape field, after the pigs had eaten off most of the rape, and were allowed to root all they pleased. They were given light feeds of skim milk and ground oats, with a little corn, so their appetites were keen and they soon had a good part of the field "plowed." They ran here until the 15th day of December, which is pretty wintry in this climate. Some early snow falls kept the frost out of the ground, so they were able to root for part of their living until they were taken into the pens. With an old door we shut off part of the open side of the shed, and threw up a little banking of earth around the bottom boards. In their saucer-shaped nest which they scooped out of the dry soil, and which we lined with straw, they seemed as snug as the proverbial "bug in a rug". They kept in fairly good flesh all the fall, and by the time we were ready to take them in they had developed a fairly heavy coat of bristles.

On the 5th and 7th January these three brood sows gave birth to litters which aggregated 34 pigs, all alive and all strong except two small ones in a litter of 12. These two little ones died and three others were lost through accident, so we raised 29 out of the 34. This is not by any means a very remarkable record, but it is considerably above the average, and, I am convinced, can often be duplicated with good sows when fed the right kinds of foods and furnished with means of exercise in the fields or woods.

C. S. MOORE
Stanbridge East

THE DAIRY

NEW POSSIBILITIES IN DAIRYING

An address given at the Eastern Ontario Dairymen's Convention, Renfrew, January 5th 1916

(Continued from March issue)

III The Manufacture of Small Hard-Pressed Cheese

With your permission I now come to a brief discussion of making of the small hard-pressed cheese. *I have spoken of the changing economic conditions;* I have spoken *of the necessity of a study of the public taste and market demand;* I have spoken *of the public which is increasingly concentrating at your own doors;* I have spoken *of the comparatively small consumption of the standard Cheddar cheese.* How can you best take advantage of these changing conditions? How can the position be improved? Largely I feel sure it is to be done by the market meeting the consumers half way, and providing them with a small cheese suitable for an average family, and yet having qualities equal to the best Cheddar cheese on the market.

You will agree with me that one reason why the householder and the hotel keeper is not a more enthusiastic buyer of cheese is because of the impracticability of dealing with a large quantity at a time. On the other hand if a small portion be purchased the extent of cheese surface exposed to the air tends towards drying, and deterioration of flavour and general quality. This can be overcome by the adaptation of modern methods in the direction of the manufacture of small cheeses. I shall not speak of those cheeses which are known on the market as soft cheeses, although there are great possibilities for these — for the methods adopted in their manufacture have been dealt with in bulletins issued from your own dairy school at the Ontario Agricultural College. I want particularly to draw your attention to the making of a cheese, which in its completion incorporates the advantages of both the hard-pressed varieties and the soft cheese varieties, with a minimum of the disadvantages of either. The chief difficulty hitherto experienced has been that practically all attempts to reproduce in miniature such cheeses as Cheddar, Cheshire or Leicester have resulted in a cheese having a thick rind, this causing much waste at cutting up, and further one which failed to ripen properly due to the fact that it dried up and became hard and chalky in texture with little or no flavor.

In 1910 while attached to one of the Dairy Colleges in England, my then colleague Alec Todd and I devised after much experimental work a method of manufacturing a cheese, 1 lb. in weight, which has overcome these difficulties, and a cheese which experience has proved is desired by the consumer and one which provides a profitable undertaking for the producer. This cheese embraces the qualities of a hard-pressed variety — Cheddar or Cheshire — and yet is ripe and ready for consumption ten days after making. It is, however, equally palatable and typical if trade considerations demand that it be kept in storage for as long as six weeks. It is a cheese which as regards early maturity and the incorporation of moisture bears some relation to certain classes of soft cheeses, while at the same time it possesses the distinctive qualities of a typical ripened hard-pressed cheese with respect to flavour and texture. This cheese rapidly obtained a hold on the market, a hold which has been maintained, and for the greater part of the past year it has also been successfully manufactured at and sold from the Michigan Agricultural College at East Lansing.

That there is not only an opening but a demand for a cheese of such size in Canada is acknowledged; for in the December issue of the Agricultural Gazette, Mr. Barr of the Dairy Division describes experiments conducted at the Finch Dairy Station in your own province. These experiments have been successful and the cheese produced. I lb. in weight, is being retailed at 25 cents each. Mr. Barr's experience regarding the suitability of a small cheese which can be placed in the hands of the grocer, the provision dealer and the householder himself, coincides with our experience in England, and with that of the Michigan Agricultural College at East Lansing. I would refer you to the Agricultural Gazette for the description given by Mr. Barr, and to-night will deal with the particular cheese with which I have had practical experience. This cheese is a little softer than the Cheddar, and has a flavour all its own; the texture may be described as soft and granular embodying the salient features of a typical Cheshire and Leicester, while to the touch pical Cheshire and Leicester, while to the touch it is rich and buttery. When bored with a trier the fatty smeary appearance on the back of the iron is such as is usually found only in a ripe old mellow cheese. If the top surface of a mature cheese be gently pressed with the thumb in a manner so well known to those in the trade, a perceptible break in the surface round the edge of the thumb will be noticed, showing the delicate and fragile nature of the texture.

The utensils required are in general those common in a cheese-making dairy or factory; but if such need to be purchased it may be taken as a fair average that the initial outlay is about $10 per cow. When small quantities of the cheese are to be made the whole outfit can be purchased for $50; and if large quantities are to be manufactured the only additional expense entailed is that of a larger sized vat. In the making of this, as in all varieties of cheese, a fundamental essential is clean, wholesome milk free from taint. Starter is added at the rate of 1%. The cheese may be made either white or coloured, and if the latter one dram of annatto to four or five gallons of milk gives a suitable colour. The temperature of the milk is now raised to 80°F. and the amount of acidity determined by means of the rennet test, a test which for milk at rennetting is much more satisfactory and one which gives much more uniform results than the acidimeter test. When the temperature and the proportion of acidity are satisfactory, the rennet is added at the rate of one dram to 2½ gallons of milk, 2½ ozs. to 1000 lbs. milk or such amount that coagulation is completed in 40-45 minutes. For the cutting of the coagulum ordinary curd knives are used, vertical and horizontal, the blades of the former being ⅜" apart and those of the latter ½" apart. The coagulum is cut lengthwise and across in such a way that it will leave the sections of curd ½" x ¼". The particles of curd are gently loosened with the hand, and this is continued for 10 minutes or so. After having remained for a few minutes in the whey, the curd is subjected to the process of heating, cooking or scalding. This procedure should take some 20 minutes, the curd meanwhile being stirred until a final temperature of 90°F. is reached. Stirring is still continued until a suitable firmness of the curd is apparent and the particles are then allowed to remain lying in the whey for some 20-30 minutes. When the acidimeter test shows .15-.16% acidity, the whey is drawn off, the curd cut into 4" cubes, piled, covered up with cloths and left for 15 minutes. Again the curd is cut into similar cubes, turned in bulk and each cube broken into halves; this assists in the getting rid of the whey and has considerable influence on the "short" texture so much desired in the final product. The curd is again covered up and left for 15-20 minutes. Grinding is the next operation and is usually possible about one hour after the drawing of the whey. The acidmeter test should show about .5% acidity. The curd at this stage is soft and velvety to the touch, and it should break "short" rather than have any tendency to toughness. It is ground to a fine state, salt added at the rate of 1 oz. to 3 lbs. curd, and put into the moulds at once. The moulds are made of well-tinned metal, 4" in height, diameter 3½"; the bottom of the mould is closed except for a hole in the centre 1½" diameter; a loose tin follower is used in the bottom, and a wooden follower 1" thick is needed to cover the curd at the top. The weight of curd obtained varies with the season of the year but averages 1¼ to 1½ lbs. per gallon of milk. Immediately the moulds are filled, they are put under the press and left for 2 hours with just the dead weight of the press applied. *From the time of adding the rennet to the grinding of the curd the whole process has occupied as a rule not more than 3½ hours.* After being pressed as stated for 2 hours, the pressure is released, the cheese are taken out and turned and again pressed for a further 2 hours, this time a little additional weight being added. The pressure may now be finally released. The cheese are allowed to remain in the moulds during the night and through the following day. They are then smoothed up with a palette knife and bandaged with calico and paste; or if more convenient they may be smoothed up and paraffined. They are removed to the ripening room and in this connection I may say that we have obtained good results when the cheese are required to mature in say 10 days time by using a ripening room at higher temperature than is commonly in vogue; as high a temperature as 60-65° having given satisfaction. Of course if the cheese need to be kept for a longer period they must be moved after the first few days to a cool or cold room. Usually slightly more than 1 lb. ripe cheese is obtained per gallon of milk, and for trade purposes it is recommended that these small cheeses be wrapped in tinfoil.

The cheese is complete; the method of manufacture is not widely at variance with the methods already adopted; the utensils required are such as are commonly in use in any uptodate cheese factory; and the skill required is such that a trained cheese-maker can with comparative ease adapt himself.

In conclusion I would again appeal to you to find out what the public wants. To-day success is to be assured as a result not only of expert technical knowledge of the art of manufacturing, but by the maker at the same time displaying a due appreciation of the psychology of the public taste. Those who can provide what the public wants enjoy far greater possibilities of success than those who produce that which they think by the public *should* be wanted.

You are the official link by which the interests of producer and consumer are bound together.

WILFRID SADLER

Ayrshire herd of Mr. Hector Gordon, Riverfield.

HUNTINGDON DAIRYMEN'S ASSOCIATION

THE practical side of things characterized the 34th annual convention of the above Association, held at Hemingford, Que. on February 18th. The President, D. H. Brown, Beith, in his opening remarks paid a tribute to the progressive men who organized and successfully carried on the work of the Association for 34 years. The late D. M. Macpherson, its first president, and his successor, Mr. Robert Ness, and those associated with them laid a strong foundation on which the men of to-day could continue to build. Great advancement in agriculture and dairying had been made since the organization of the association and methods advocated by its founders, but then considered by many impracticable, are now widely practiced.

The Secretary, Mr. W. F. Stephen of Huntingdon, in his report of the year's work referred to the past year as one of the best in the history of the district. Large crops, an increased milk flow, and higher prices for dairy products had been realized. There was a bigger make of cheese and more milk and cream shipped to the City than ever before. He contrasted present conditions in the district with those of 30 years ago, when there were over 40 cheeseries and 10 or 12 creameries. Now there were less than a dozen cheeseries and 6 or 8 creameries, owing to the bulk of milk and cream going to Montreal. The condensery at Huntingdon and receiving stations at Ormstown also took a large quantity of milk that formerly went to factories. It is recognized that the purest and cleanest milk received in Montreal comes from this district. The financial statement showed a balance on hand of $10.67.

A proposal to change the name of the Association to "The District of Beauharnois Dairymen's Association" evoked considerable discussion. A notice of motion to make the change at the next annual Convention was given by Mr. Wm. Greig.

Prof. Barton made a survey of the conditions surrounding the production and sale of horses. The marketing end was important. He surprised his hearers by stating that in spite of their many competitors horses were the only class of live stock that had made a steady increase in numbers. There were fewer cattle, sheep and swine in Canada and the United States than a few years ago. The West had taken many of our horses. In 1909 19,741 horses passed through Winnipeg; 33,571 in 1910; 26,072 in 1911; 4932 in 1912 and comparatively few in 1914 and 1915. Local demands, the opening of new country, lumbering and commercial enterprise were all factors demanding a supply of horses. At present there was little call from the west for horses and lumbering was quiet. Therefore the cities were our chief purchasers. The demand caused by the war was not as big as was expected, but up to Jan. 1st, 1916, over 42,000 horses had been purchased in Canada for war purposes, and more would be required. The greatest competitor of the horse was the tractor engine, but it had been shown that on the land the horse was still the cheapest propelling power. The auto had displaced the lighter class of horses to some extent, but there would always be a place and demand for good drafters. He considered this should not be overlooked and farmers should rear one or more colts each year. At the College farm they had found the idle horse in winter was a loss. Breeding the mare so as to foal in the fall would overcome this loss to a large extent. Farmers must learn that a better quality horse is wanted. They must breed only their best mares to the best available stallion and thus have high class stock. The cost of production was increasing, labor being the chief factor, and farmers must improve conditions so that better horses may be more economically reared.

Mr. James Morris, M. P. for Chateauguay County, referred to the splendid work of the Live Stock Commissioner, in making it possible to secure the best class of breeding sires, to the great possibilities in the dairy industry and to the work of the small experimental farms, one of which had been established at St. Chrysostome.

Mr. Fred H. Grindley of the Fruit Branch, Ottawa, spoke of the marketing of apples and commended the co-operative system now so successfully carried out in Ontario, Nova Scotia, British Columbia and certain parts of Quebec. Montreal was the natural market for Quebec apple growers and if they did their duty there would be no apples imported from the United States to supply the demand. He recommended box packing for table apples, such as Fameuse or McIntosh Reds. For the later varieties he thought barrel packing was best for this province. While the market was now affected by the war, this was only a temporary condition and there is bound to be an ever-increasing consumption of good apples. The Fruit Marks Act is a great protection to the producer. He said the three essentials to successful apple production were care of the orchard, honest packing and co-operation. These if carried out would make such a section as Hemmingford famous for the production of high-class apples and would return to the growers a good profit on their investment. The placing of a tariff duty of 90 cents a barrel and 30 cents a box on apples imported into Canada would practically save the fruit industry of British Columbia, and would also be helpful to fruit growers in others parts.

Mr. Peter Reid of Chateauguay Basin, secretary of the Quebec Pomological Society, gave an interesting paper on the "Care of the Orchard". He said there were few farms but what had a spot suitable for an apple orchard. In planting an orchard he advised that the ground be thoroughly cleaned by the growing of hoed crops. If ground is low and springy, underdrain. In planting, holes should be made sufficiently large so that the trees may be moved either way to insure straight rows. Put the best soil about the roots, and the ground around the trees firm with the foot. Plant well-grown trees of two year old growth from the graft and cut back the last year's growth to three or four buds. Thorough cultivation insures growth, ripens the wood and makes the tree more hardy for the winter. Shallow cultivation of the orchard as the trees grow larger and the sowing of 15 to 20 lbs. of crimson clover in July, left on the ground and plowed in the Spring fosters the growth of the tree and at the same time ripens the wood and thus the tree becomes more hardy. Pruning is important. The tree should be cut back so as to leave it low headed and heavier on the side of the prevailing wind. Fertilization should not be neglected, 8 to 10 tons per acre of barnyard manure with 500 to 600 of good fertilizer will give good results. Wood ashes are beneficial, especially in bearing orchards. Apples cannot be successfully grown if spraying is omitted. The mixtures recommended, applied by a large hand or power sprayer three or four times during the season and at proper times will give excellent results. There is no reason why in the province of Quebec the growing of apples should not be made a more prominent feature of agriculture. We have a splendid home market and Quebec apples should be sold in large quantities instead of apples from the State of Washington and Idaho.

C. E. Baxter of the Fruit Branch, Ottawa, spoke on the Fruit question from the Inspection and Sale Act standpoint, and explained more fully the methods of sorting and packing of apples.

The "Building up of the Dairy herd, by the Use of pure-bred Sires", was ably handled by R. R. Ness, Howick's noted Ayrshire breeder. He stated that the influence of the good purebred sire was the most important factor in the improvement of the herd. He considered that the sire was more than half of the herd. The inferior sire should go to the butcher. Sires should be selected from families of good type backed up with good records of milk and fat. A few dollars' difference in price between a good and inferior sire was often more than made up by the first crop of calves. Mr. Ness advocated the keeping of the old bull until his usefulness was past. Often good bulls went to the butcher before their ability to produce heifers of high quality had been established. In selecting a sire choose one that is strong and vigorous and especially strong where the females of their herd are weak. Where the herd production had increased it was frequently due to the better sires used from time to time. In the discussion which followed co-operation in using the good old sire was strongly advocated.

Mr. Neil Sangster of Ormstown, the well-known Holstein breeder, said that he recognized the importance of using only sires of quality. Along with this he advocated paying more attention to the babyhood of the cow. He claimed that many cows were ruined by being stunted when in the calf period through lack of proper feed and care and therefore there was no development. This is in evidence in many parts of our country. The undeveloped cow was more subject to disease, and from this class we get the great numbers of "boarders". The calf should be well fed. New milk should be used at first three times a day. At about three weeks old the gradual substitution of skim milk should be begun. From now on the calf should be kept in a growing condition by increasing the skim milk ration and gradually adding meal so that at maturity its development may be insured. Scours, the bane of the dairy calf raiser, was usually caused by overfeeding. When the heifer is six or seven months old the task becomes easier as she then can handle and assimilate coarser foods. From now on she should be kept thrifty but not fat. When she should drop her first calf depends on the breed, size and development of the heifer. Some claim that early breeding develops the milking propensities of the heifer. Where such is practiced, from 18 to 20 months should elapse between the first and the second lactation period to allow for growth and development. The cow making a large amount of milk works as hard as any horse and must be well fed and cared for.

Mr. J. D. Leclaire of St. Hyacinthe, who represented the Hon. J. E. Caron, expressed the regrets of the Minister. He referred briefly to the new law governing creameries and cheeseries, which was an advance step.

The evening session was opened with an illustrated address from Prof. Jull of Macdonald College on "Farm Poultry".

This was followed by an interesting address on "The Bad and Good in Dairying", by Mrs. Laura Rose Stephen of Huntingdon, illustrated by 70 fine slides, which brought vividly before the large audience the important points made by the speaker. Splendid specimens of the different breeds of dairy cattle were thrown on the screen and many cows famous for their high production were introduced. The pictures of a scrub bull, and of the $50,000 Holstein bulls, were in themselves a sermon on selection.

That "like produces like" was strongly demonstrated by the pictures of the champion Ayrshire bull of Canada, Hobsland Masterpiece, and his son, Hobsland Perfect Piece, the champion Ayrshire bull of the United States. The characteristics which placed them at the top were identical.

The bad and good in barn locations and constructions, the interior of barns with special reference to ventilation, lighting, mangers, etc. were shown. Great emphasis was laid on the atmosphere being clean when milking is going on. There should be no putting down of hay or cleaning out of stables just before or during milking. An interesting slide was one showing a section of a cow's udder. Mrs. Stephen described the theory of milk secretion and convinced her hearers that the milk was almost entirely secreted during the actual process of milking. Gentle treatment of the cow and quick firm milking do much in adding to the milk flow. The slide showing how easily the farm well may become contaminated from surface drainage should cause the farmer to think of the dangers that may assail the water supply. Another educational picture was the milk route of a town showing an outbreak of scarlet fever in about 50 homes which could be traced to one farm where there was a case of the fever. A slide showing the bacteria on just one dirty cow-hair emphasized the need of clipping the hind quarters and keeping the cows' flank and udder clean and for having hooded milk pails.

The efficacy of cooling milk was demonstrated by showing the small development of germ life in milk cooled quickly by water, while milk allowed to cool naturally abounded with germ life. Looking for the best, keeping the best, doing the best, was the keynote of the hour's talk given by Mrs. Stephen.

A resolution was passed requesting the Department at Quebec to grant to Macdonald College the necessary funds to keep its demonstrators at work.

The following officers were elected:— President, D. H. Brown, Beith, Que.; Vice-President, R. R. Ness, Howick, Que.; Secretary-Treasurer, W. F. Stephen, Huntingdon, Que.; Directors: Alf. Alseph, Valleyfield, Que.; Neil Sangster, Ormstown, Que.; Hector Gordon, Howick, Que.; D. A. McCormick, Allan's Corners, Que.; John McDougall, Ormstown, Que.; M.M. McNaughton, Huntingdon, Que.; David Pringle, Huntingdon, Que.; Geo. Bustard, Jr., Vicars, Que.; R. T. Brownlee, Hemmingford, Que., and Geo. Tennant, St. Louis, Que.

MAUD S. AND DAN PATCH

NAMES to conjure with amongst lovers of horseflesh were Maud S. and the famous Dan. They were the outcome of patient training grafted on sterling qualities of form and endurance; they were developed is speed and staying power when some evidences of their excellence had been discovered.

In the dairy world many names of excellent cows are emblazoned in history. They have made astounding records in the hands of careful feeders who discovered their great capacity. Note two points; first, although many good records are now known, the possibilities of such yields of milk and fat were, in many cases, totally undreamed of even by the men who at one time owned such magnificent cows; second, what has added to the value of the world's record breakers is the very fact that simple, cold arithmetic has been used to calculate the milk and fat production.

Some system of dairy records, then, has helped this discovery of the compeers of Maud and Dan; records are helping dairymen today to discriminate intelligently between the plodding utility cow and the high speed, long-endurance cow. A note to the dairy division, Ottawa, will bring any reader, without cost, samples of record forms, the keeping of which will prove a useful eyeopener, and increase your income.

C. F. W.,

Dairy Division, Ottawa

A SKIM MILK VARIETY

MOST of our dairy farmers are well accustomed to hear of milk "testing" so much, either high or low, understanding thereby that it contains a certain percentage of fat. What is not quite so clear to the majority, is the fact that milk varies considerably in its test, or content of fat, from day to day, even from one milking to another on the same day, and from month to month. This applies to mixed herd milk and more particularly to milk from single cows.

Thus, if milk is valued according to its fat content, it is evidently of extreme importance to every dairy farmer to know what the milk does test; further he needs to know, whether selling cream or pooling milk, if Spot's milk tests 2.5 or 4.8, if Blossom's milk tests 3.1 or 5.2 per cent of fat. In one herd where six samples of milk from each cow were tested each month, it was found that three cows averaged only 1.8, 2.8 and 2.7 per cent of fat for the whole year. Do your cows give real milk or only a skim milk variety? You need quality as well as quantity. Are you getting both? Cow testing is necessary for your peace of mind.

C. F. W.,
Dairy Division, Ottawa

A SEASONABLE SUGGESTION

NOW that the regular factory patron is getting to think more and more about cow testing, preparing in many localities to take weights and samples as soon as the first cow freshens, it would seem opportune for more factory owners to consider this matter seriously. If a larger and better milk and cream supply is wanted, then talk up cow testing, get more patrons interested. If reduced operating expenses are sought, with a larger output of better quality, then recommend cow testing to every dairy farmer in the vicinity. For in the ways above indicated, and in very many others, the factory must benefit.

The assistance from the dairy division of the department of Agriculture at Ottawa is just as liberal as in former years. Where a cow testing association is organized and a thoroughly competent person will do the testing of milk samples from individual cows once a month, supplies of preservative tablets and sulphuric acid will be sent free of charge together with the necessary blank forms; beyond this, a payment of five cents per sample tested will be made. Factory owners, cheese and butter makers will do well to note these facts and act promptly.

C. F. W.,

Dairy Division, Ottawa

POULTRY

EGG CASES AND FILLERS

Editor Journal of Agriculture :

OWING to the loss of a great number of egg cases from year to year, the produce dealers have, during the past twelve months, been advocating non-returnable cases and at the Annual Meeting of the Canadian Produce Association in Belleville on February 9th last, a resolution was passed confirming the adoption of non returnable cases to go into effect March 1st, 1916, the cost of the case to be included in the price of the eggs.

It is expected that by having the cases supplied by the shipper, there will be an improvement in the quality of the eggs. From a sanitary standpoint it has another advantage, as it means the eggs will, in most instances, be shipped in new cases and fillers, thus doing away with a lot of old cases which have been the cause of musty and inferior eggs.

We would suggest for a non returnable case, the following thicknesses :

Top, sides and bottom	3-16"
Ends and centre	7-16"
End cleats	1½x7-16"

No cases that are shipped to the country should be stencilled or branded with any name or distinctive brand.

In order that the eggs arrive at their destination in good condition and free from breakage, the shippers should see that a pad of excelsior or cushion filler be used in the bottom of each case and a cushion of excelsior or other suitable material be placed between the eggs and the top of the case.

It is to the interest of the shippers, therefore, to look ahead and provide themselves in advance with cases and fillers.

The "Loss Off" system of buying eggs has proved a great success during the past two or three years and resulted in a great improvement in regard to quality. It was unanimously agreed by all dealers present at the meeting in Belleville that all eggs be bought on that basis the year round, in fact, a further step was taken by a resolution being passed by the Association confirming the action of the Committee on Resolutions in memorializing the Government to make the buying and selling of bad eggs a criminal offence with a penalty attached.

We believe, therefore, it would be in the interest of all concerned if all storekeepers and buyers candled their eggs before shipping.

Following is a list of egg case manufacturers and manufacturers of egg case fillers:—

The John Carew Lumber Company Ltd., Lindsay, Ont.
The London Box Mfg. & Lumber Co., Ltd., London, Ont.
Firstbrook Bros. Limited, Toronto, Ont.
Georgian Bay Shook Mills Ltd., Midland, Ont.
Walter Woods & Co., Hamilton & Winnipeg.
The C. Beck Mfg. Co., Penetanguishene, Ont.
The Graves Bigwood Co., Byng Inlet, Ont.
Pariseau Frères Ltd., 60 Ducharme St., Montreal, Que.
Holmes & Arpin, 235 Chatham St., Montreal, Que.
Martin Frères Limitée, 206 St. Patrick St., Montreal, Que.
Dominion Box & Package Co., Ltd., 60 Levis St., Montreal, Que.
G. & J. Esplin, 126 Duke St., Montreal, Que.
D'Israeli Box Co., d'Israeli, Que.
G. W. Crombie, Kingsbury, Que.
Edouard Ruel, Lauzon, Que.
Papineauville Lumber Co., Ltd., Papineauville, Que.
Estate Davidson Box Mfg., Ottawa.

Egg Case Filler Manufacturers:

Miller Bros. Co. Ltd., 38 Dowd St., Montreal.
Trent Mfg. Co. Ltd., Trenton, Ont.

ALBERT H. DALRYMPLE,
President,

The Canadian Produce Association.

A. VAILLANCOURT, Sec-Treasurer
618 St. Paul St. West
Montreal.

SECURING HIGH FERTILITY

IT should be the object of all who are doing any incubating to secure the largest possible number of chicks from the eggs set. This means that in the first place the largest possible number of fertile eggs must be secured, for only fertile eggs will hatch; in the second place the eggs must come from good healthy stock which has been selected with care; the eggs for incubation must be good, or strong healthy chicks will not be hatched. Inferior breeding stock, poorly mated, cannot produce good eggs for hatching purposes and no amount of attention in the incubation of the eggs, and good management in the rearing of the chicks will make up for lack of vitality in the eggs set.

The condition of the breeding stock and the method of housing, feeding and breeding affect the fertility and vitality of the eggs. The breeding stock should be given the very best of conditions; good, dry houses with plenty of fresh air; wholesome feeds, well fed, and proper selection and mating.

Above all, keep the floor of the house dry, and provide the birds with plenty of fresh air. In feeding compel the birds to take plenty of exercise and do not get them too fat. Whole grains should be scattered in the litter which is kept six or eight inches deep. Dry mash may be given in self-feeding hoppers and if wet mash is given during the breeding season it should be fed very lightly. Also, the amount of animal food, especially green bone, should be restricted since it has been found that liberal feeding of green bone affects the hatchability of the eggs. Skim milk, however, may be given freely as it tends to keep the birds in good health.

The breeding stock should be healthy and vigorous, for it is the foundation upon which the health of the chicks depends. The breeders should be strong birds, fully developed and well matured. A full, bright eye and good breadth and depth of body are essential features to keep in mind in selecting birds for the breeding pen.

In the smaller breeds, such as Leghorns, from ten to fifteen females may be mated to one male. With heavier breeds, such as Plymouth Rocks, Wyandottes and Rhode Island Reds, about ten females may be mated with one male. Yearling hens make the best breeders and these are usually mated to well developed cockerels.

M. A. JULL

HOW TO HATCH CHICKS

FARMERS and people throughout the Province of Quebec are making preparations for the chick hatching season. Those who wish to secure best results in hatching may obtain good information by writing to the Poultry Department, Macdonald College, P. Q. for a bulletin on "Farm Poultry", which will be sent free upon request.

BROODING CHICKS

UNLESS a chick is strong and active when taken from the incubator it should be killed. The elimination of the weaklings is one of the first steps in the proper management of chicks. Usually the weak and puny chick is not worth saving; the majority of chicks which are weak at the time of hatching die before reaching maturity and of those which do live comparatively few become profitable fowls. The rule of good practice is to kill all weaklings at the time of hatching.

There are few unfavorable conditions so disastrous to successful chick rearing as overcrowding. As an individual, a healthy chick may be quite robust, but when placed with one hundred other chicks it may have a small chance to attain normal growth. The larger the number of chicks brooded together the smaller are the chances for any of them to grow properly, and the greater are the risks in loss of life. There is, of course, little danger of overcrowding when chicks are being brooded with hens, but when chicks are being brooded artificially, there is a tendency to brood them in large numbers. Ordinarily the number of chicks to be brooded together should not exceed 50, but there are some exceptions to this, for, with very careful management about 150 can be brooded together.

THE NATURAL METHOD OF BROODING

The brooding of a limited number of chicks with hens is much easier than brooding them with artificial brooders. The average hen will brood from ten to fifteen chicks quite successfully.

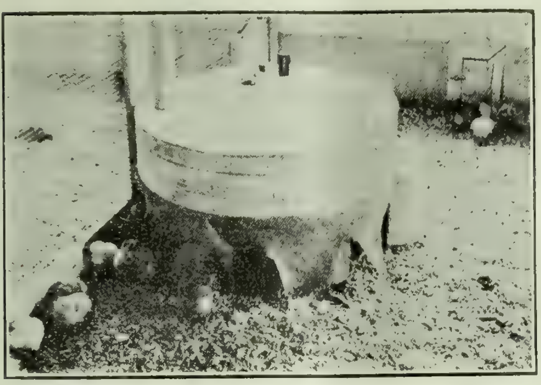
Where a number of hens hatch their chicks at the same time, the various broods may be divided among a portion of the hens and the balance may be placed in the laying pen.

There are many who believe that they can get better and stronger chicks by using hens to do the hatching and raising, while there are some who can operate an incubator successfully but cannot raise the chicks in brooders. In such cases the chicks should be raised with hens. Take a sufficient number of hens to accommodate the chicks to be taken from the incubator, and set them three or four days before the hatch is to come off. Give each hen two or three eggs from the incubator and let her hatch them, and then when the incubator chicks are all hatched, give her ten to fifteen chicks. The chicks should be placed under the hen at night, and in the morning she will take to them all right.

One of the first things that should be done is to make sure that the hen and chicks are entirely free from lice. Dust the hen thoroughly with good commercial insect powder. With the feet in the left hand hold the bird head downward and sprinkle the powder thoroughly into the feathers. With the right hand rub the powder into the feathers, particularly around the joints.

During the first two or three weeks it is ad-

The "Short Course" Class at Macdonald College, in attendance from Feb. 14th to March 3rd.



A portable brooder or hover which accommodates fifty chicks.

visable to keep the hen confined in a coop. The little chicks should not be allowed too much freedom at first, and especially they should not be allowed out of the coop while the grass is damp from dew or rain.

It is advisable to make the coop as serviceable and economical as possible. Avoid making a lot of cheap coops which in a short time become useless. This is a common mistake upon many farms.

The most serviceable coop is one which serves to brood the chicks and to house the chicks during the growing season after the brooding period has ended.

Yards and fences are not necessary, except where a large number of chicks are being brooded at the same time. The coops may be placed in different parts of the orchard and fields, and in this way the chicks are given free range on clean soil. It is important to avoid keeping a large number of chicks on the same ground year after year. Keep the soil sweet and clean, and the chicks can usually be kept in good health.

Warmth is the first requirement of young chicks. When the chicks are placed in the brooder the temperature should be about 95°, and this should be lowered gardually from week to week. The exact amount which the temperature should be lowered depends upon the season. In the early season the chicks will require brooding at a higher temperature for a longer time than later in the season. For chicks that are hatched between the middle of April and the middle of May, which it about the best time to hatch in Quebec, the chicks should be brooded for about six weeks.

It is better to keep the temperature a little on the cool side, rather than too warm, for too high a temperature during the first two or three weeks often causes leg weakness.

The type of brooder which the farmer should use will depend upon the number of chicks he raises each year. Under certain conditions fireless brooders may give fair satisfaction, but they cannot be recommended for general use. Most farmers will find the portable brooders quite satisfactory for raising a few hundred chicks. Where a larger number are to be raised the stationary brooder may be used.

In many cases the brooders are placed in permanent houses, but if they can be placed in portable houses the chicks will do better. The portable houses can be moved from one field to another, or they can be located in different parts of the orchard each year. In this way the chicks are raised on fresh soil and will always grow faster. A cultivated field where a certain amount of green food is available is almost an ideal place for growing chicks. They require plenty of freedom, and overcrowding them on a small area of land will cause much trouble. Overcrowding and raising large numbers on the same ground year after year is often a serious fault on many commercial plants. The chicks rarely look thrifty and few of them develop into good producers.

Give the chicks plenty of shade. On most farms the chicks have access to shade trees and buildings during hot weather, but on some farms chicks are continually raised on small bare yards where they have not the slightest chance to do well.

All brooders and brooding quarters should be thoroughly and regularly disinfected, using a good commercial disinfectant.

M. A. JULL

WOMAN'S WORLD

FOODS AND FOOD PREPARATION

Lesson XXIV

Cream of Vegetable Soups

CREAM of vegetable soups belong to that class of soups which are made without meat. Their foundations are milk, vegetables and water. These soups are most nutritious and easy of digestion and should appear on the family menu for luncheon and supper much oftener than is generally the case.

The cream of vegetable soups contains:

1. Milk—rich in tissue building material, especially in the bone building material.
2. Vegetables—rich in either starch or sugar which supplies the body with energy, and in *valuable mineral matter,* which regulates the blood.
3. Butter—rich in fat which keeps the body warm and gives it the power to do work.
4. Water—essential to every cell in the body.

Miss F. Rose in "Rule for planning the family dietary" says, "Milk should be used liberally in order to replace a part of the meat in the average dietary and because of all the foods it is the richest in lime. Adults need considerably less milk than do children, but they are better nourished if milk is present in the diet."

If either children or adults do not care to drink all the milk they require, the cream of vegetable soup is a splendid means of supplying the balance.

In the preparation of these soups care must be taken to separate the starch grain to avoid lumps and also to *thoroughly* cook the starch of both the vegetable and the flour.

Cream of Vegetable Soup

1. c. milk.
1 c. vegetable water.
½ c. vegetable pulp.
2 tblsp. flour for non-starchy vegetables.
1 tblsp. flour for starch vegetables.
2 tblsp. butter.
Salt and pepper to taste.

General Rules for Combining Cream Soups

Cook vegetables until tender. Strain and reserve vegetable water. Press vegetable through a sieve. Make a white sauce using milk, butter and flour. Add vegetable water and pulp, and seasonings as desired.

Cream of Tomato Soup

½ can tomatoes, or 2 cups strained tomato.
2 tsp. sugar.
1 slice onion.
¼ tsp. soda.
4 tblsp. butter.
4 tblsp. flour.
1 qt. milk.
1 tsp. salt.
⅛ tsp. pepper.

Scald milk with onion. Remove onion and make a white sauce of the butter, flour, milk, salt and pepper. Keep sauce covered in double boiler. Cook tomatoes and sugar fifteen minutes. Add soda and press through sieve. Combine mixtures just before serving .

Note: Tomato soup made in this way will not curdle.

Tomato Bouillon

4 cups stewed tomato.
1 tblsp. chopped onion.
6 cloves.
½ bay leaf.
½ tsp. celery seed.
½ tsp. pepper corn.

Mix all ingredients and boil 20 minutes. Press through a sieve. Reheat and season to taste. Serve in hot bouillon cups. A little whipped cream may be placed on top of each serving at the moment of serving.

F. CAMPBELL

QUEBEC INDUSTRIES AND THEIR ENCOURAGEMENT

By The Canadian Handicrafts Guild

WHAT are Handicrafts ?
What are Canadian Handicrafts ?
What is The Canadian Handicrafts Guild?

In the strict sense of the word "handicrafts" means intelligent and honest manual work put into the ordinary things of life by persons whose natural talents, guided and developed by more or less training, enables them to improve and even create standards and at the same time earn a little money for themselves. The true workman or woman puts some of his or her own personality into work. This is a true asset and should be encouraged in the home by the parents or grandparents when handing on their knowledge to the younger generation. Thus will the native skill of the Indian and of all later settlers be developed and improved by each man or woman showing and comparing their work with that of their neighbours.

Also, the need of money is an ever-present one, and good work brings money to the worker, if that work can be brought to the notice of the buying public. Many residents of Canada are more or less cut off from the larger centres, and at the same time from opportunities of knowing what their neighbours are doing in the way of handwork, and it was to meet this difficulty that about ten years ago a few far-seeing men and women formed "The Canadian Handicrafts Guild" which to-day is the widely recognized friend of every Canadian handworker from the Atlantic to the Pacific Coast. It is a society which has undertaken to protect and, when necessary, to restore or revive the native cunning of the Canadian people. It is prepared to get in touch with the isolated and remote worker, wherever he or she may be, and to recognize and employ any latent talent which will keep up good standards of work throughout the country. The Guild also undertakes to visit the workers, and to exhibit, distribute and find a market for such work. For example, while travelling in an out of the way part of this Province a member of the Guild saw by chance some good pieces of catalogne. On making inquiries it was learned that the women wove this and changed it at the village store for provisions—no money came to them—but the owner of the store sent the carpet to the larger towns and sold it for a good price. The Canadian Handicrafts Guild got in touch with the women who, as a result, have now a carpet industry which brings them a steady income and secures at the same time a larger outlook on the world for their children. The carpet is sent direct from the looms to our Handicraft Shop, and when sold, the money is sent direct to the worker.

By its charter, the "Canadian Handicrafts Guild" can make no profit for itself, but invites all Canadians (and by Canadians we mean all men and women of whatever nationality now making their home in Canada) who are able to earn money by handwork to avail themselves of this opportunity of helping to help themselves. Headquarters are at No. 592 St. Catherine Street West, Montreal, with various Branches throughout the Dominion. Capable men and women give their time and service free, and a store known as "Our Handicrafts Shop" is open to all who have suitable work to offer for exhibition or sale. Here are to be found bales of homespuns and linens, catalogne, lace, rush bottomed chairs, hooked and braided mats, Indian work and basketry of all kinds, handmade toys and other products of Canadian homes.

The Guild keeps up the standards of work by a few simple conditions. All articles must be handmade—the patterns good, material and colours solid and lasting, being, if possible, made with vegetable dyes. Prices, and this is important, must meet those quoted for similar goods made elsewhere and sent to the same market.

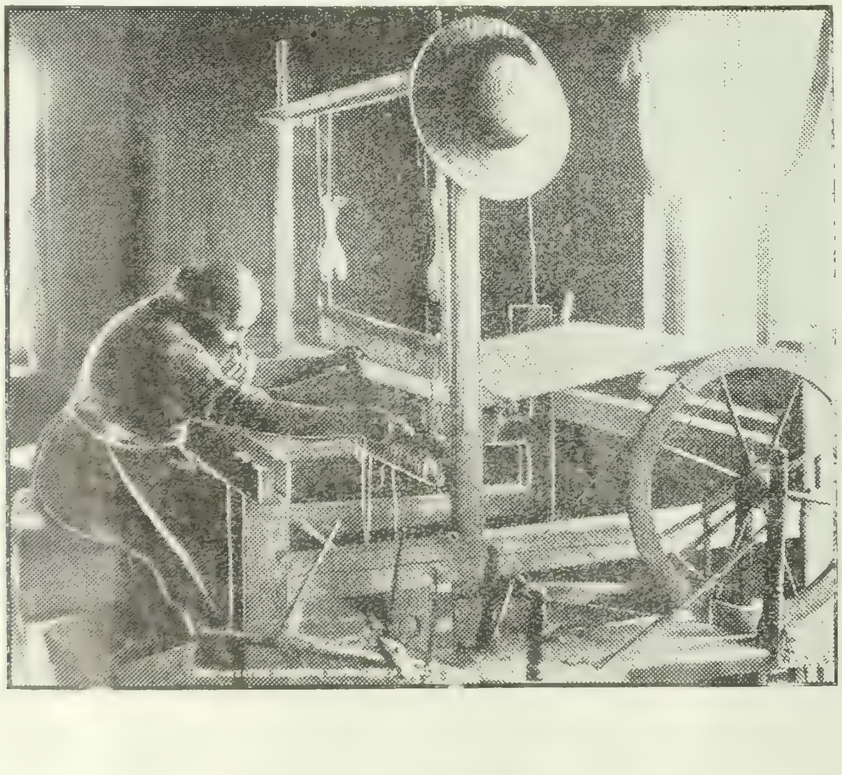
In a series of articles which the Guild through the courtesy of our Provincial Government has been given permission to publish from time to time in this Journal, it is proposed to explain the necessity for such conditions, and to show how skilful and willing workers can conform to them; thus making a livelihood for themselves and at the same time a reputation for Canadian handwork. In this connection let us quote an incident which occurred in the home of one of our workers:—

Several of the daughters had brought home from visits to the City highly coloured carpets and other factory products which they had admired, displacing the rag carpets, mats, etc. woven by their mother and grandmother. These, however, were carefully preserved by one of the daughters who still admired them. One day a famous artist visited the home and saw these displaced "household goods." The mother noticed him examining a rug and said, "I see you looking at my old carpet." "Looking at it," he replied, "loving it. I could look at those colours and feel the softness of the texture all day and for many days. Never let yourself forget how to do such wonderful and beautiful work."

There is much to be said as regards good wool, dyes, homemade chairs and toys, — patterns and distinction in work,—exhibitions and what to exhibit—and lectures and the opportunities which arise for selling certain articles. Each paper, besides general information as regards handwork, will try to explain the importance of some one branch of national work.

As more than half of the history of the world is a history of hand-work, the "Canadian Handicrafts Guild" recognizes an equal responsibility between English and French Canadian neighbours which should not be overlooked, and which can only be forgotten when the city resident and country agriculturist agree to divide it between them. The country man or woman must realize his or her importance to the nation, and that no matter how remote their place of abode each has a special task which no one else and no other household can fulfil, and that in growing flax, supplying rushes, hooks, dyes, looms, wool, reeds or rag carpet for his or her family's occupation, the great work of nation-building is being helped just as much as by writing laws or inventing machinery.

Now, Quebec can grow flax and in the present state of affairs whoever will have linen to sell next year can pay himself many times over for his trouble. Firm soil on a moist sub-soil is not hard to find in Quebec—and if a crop of oats or potatoes grew in it last year, or if it was lately used for pasture, so much the better; there will not be so much weeding as in fields long under tillage. The land, in any case, will have been ploughed in the Autumn, so there will be nothing to do in April but to work it with grubber, harrow and roller before sowing the seed by hand or machine. An important precaution is the taking away of all clods and stones, however, for these would break the close formation of the little regiment as it appears above ground. Advice can always be procured from the Government; and the "Canadian Handicrafts Guild" has its shop waiting to dispose of the best products. With these incentives we hope there will be a universal sowing of flax this Spring, for the country will want linen next year, and we know we can grow it.



LIMERICKS OF INFELICITY

A lady as pround as old Lucifer
Is tired of her husband's abucifer.
She says she will see
If she ever gets free
Love doesn't again make a gucifer.

A young wife complained to the Gov.
Her husband was rude and kept shov.
Tho but recently wed
He had changed, so she sed,
And had quite given up lovey-dov.

—*Boston Transcript*

NOT AGEING

"How are you to-day, John"? said a landlord to one of his tenants, whom he met in the street.

"Vera weel, sir, vera weel", answered John, in his usual way; "if it wasna for the rheumatics in my right leg".

"Ah, well, John, be thankful, for there is no mistake you are getting old like the rest of us, and old age does not come alone".

"Auld age, sir" replied John. "I wonder to hear ye. Auld age has neathing to dae w'it. Here's my ither leg jist as auld, and it's soond and soople yet".

Right down through the centuries man has recognized the importance of maintaining the productiveness of the soil as assuring the progress of the race.

Varro (B. C. 116 to 28) wrote: "The land must rest every second year or be sown with lighter kinds of seeds, which prove less exhaustive to the soil".

Virgil says: "Linseed, poppy and oats exhaust the soil".

"Still will the seeds, though chosen with toilsome pains.
Degenerate, if man's industrious hand
Cull not each year the largest and the best.
'Tis thus by destiny, all things decay
And retrograde, with motion unperceived".

Columella, in the first century A. D., writes: "No one gifted with common sense will ever permit himself to be persuaded that our earth has grown old, as a man grows old. The sterility of our fields is to be imputed to our doings, because we hand over the cultivation of them to the unreasoning management of ignorant and unskillful slaves". Columella also recommended the growing of alfalfa and vetches, commending their virtues in the highest terms.

Baron Von Liebig wrote in 1859 relative to these sayings and quoted from Columella. He says: "All these rules had, as history tells us, only a temporary effect; they hastened the decay of Roman agriculture; and the farmer ultimately found that he had exhausted all his expedients to keep his fields fruitful and reap remunerative crops from them. Even in Columella's time, the produce of the land was only fourfold".

A FEARFUL OCCURRENCE.—A gentleman farmer tells of a city lad who once worked for him.

The lad was called one winter morning before dawn and told to harness the mule to the dearborn.

The lad was too lazy to light a lantern, and in the dark he didn't notice that one of the cows was in the stable with the mule. The farmer, impatient at the long delay, shouted from the house: "Billy! Billy! What are you doing"?

"I can't get the collar over the mule's head", yelled back the boy. "His ears are frozen".—*Collier's Weekly.*

A white man, walking along a road where an old colored man was whitewashing a fence, noticed that the brush he was using contained very few bristles. "Look here, Rastus," exclaimed the man, pausing and looking at the operation, "why don't you get a brush with more bristles in it ?" "What fo', Mistah Smith, what fo'?" returned Rastus, glancing from the fence to his questioner. "What for?" expressively replied Mr. Smith. "Why, if you had a brush with more bristles in it you could do twice as much work." "Dat's all right. Mistah Smith," said Rastus, negatively shaking his head, "but I hain't got twice as much work to do."

OF GENERAL INTEREST

PROFITABLE PRODUCTION

TWO great factors enter into the production of any crop: the farmer and the weather. Fortunately, of the two *man* is, except under very exceptional circumstances, the greater. According to our experience and observation in every provinec of the Dominion, the right crop, sown at the right time, on properly prepared land, will give profitable returns practically every year.

CROPS TO GROW

The crops to sow to insure success are those best suited to the district and most likely to succeed under such conditions, as to preparation, as maintain on the fields under consideration. The fields, however, should have been prepared for the crop desired. It should not at this late date be necessary to consider the condition of the fields in order to determine what crops to sow thereon. Further, on every farm the plan should be to grow a fair proportion of the crops, if not the whole, of such a character as to insure their being used up: that is, manufactured upon the farm itself into other more expensive products. No farmer is really worthy of being called a farmer who produces only such crops as he sells off the farm in their raw shape.

REAL PROFIT-PRODUCING

As farmers we are, many of us, prone to neglect this manufacturing side, the real profit-producing side of our business. To succeed in farming, we must, as suggested, produce largely of such raw materials or crops as we can on our own premises work up into one or more of what might properly be called the finished" products of the farm:—horses, beef, mutton, pork, poultry, milk, wool, eggs, etc. Only in this way can we hope to reap the just reward of our industry; to rise superior to the vagaries of the weather, the uncertainties of the market, or the machinations of corporations. In this way also we gradually render our fields more fertile, our acres more productive, and make of our farms *real homes*, not mere mines or banks on which we may draw periodically for a scant, and often uncertain, subsistence.

LIVE STOCK

Small beginnings in live stock farming are more likely to lead to success than are those on a larger scale undertaken without sufficient experience. Pure-bred animals in any class are, of course, the kind to keep where experience and capital combine to render success a certainty. But a few grade females and a pure-bred sire of the class and breed preferred cost little and soon prove profitable. Well graded studs, herds and flocks are likely to be as effective money-makers as pure-breds, save in comparatively rare cases. Beginning with the grade permits of learning the business in a cheaper school, then the lesson once learned the change to the more difficult to handle pure-bred clases may be made gradually, and with a certainty of success not otherwise possible.

Why not make a little start in live stock this spring, if not already into the thing? If you cannot get the live stock till fall, plan at least to grow some crops suitable for their profitable maintenance when you get them, after harvest.

J. H. GRISDALE,
Director, Dominion Experimental Farms

MICE AND APPLE TREES

Treatment of Injured Trees.—Grafting Wax or Paste should be Applied as Early as Possible to Prevent the Wood from Drying out.—Trees can be Saved if the Wounds are Carefully Treated

IF an apple tree is badly girdled by mice is usually dies. If as soon as the wound is noticed it is cleaned and covered with grafting wax or some paste, such as sulphur cowdung and clay, and wrapped with cloth to exclude air and prevent the wood from drying out, there is a possibility of saving the tree if the girdle is a small one, as the sap which rises through the wood will continue to do so, and returning through the inner bark in an elaborated condition will cause growth to be made all around the upper part of the wound, and if the latter be not too large there is a chance of its healing over. If, however, the wood becomes dry before the bandage is put on, the tree will almost certainly die, although it may continue to grow throughout the season. When the wax and bandage are applied the tree should be headed back considerably to lessen the amount of transpiration of moisture, as there will not be as much sap rise as if the tree were uninjured, and the wood will thus dry out sooner than if it were headed back. If the girdle is near the ground, in addition to covering the injured part with wax or cowdung and clay, it is advisable to mound up the soil about the tree to cover the wound and thus help to prevent the wood from drying out.

Girdled trees are frequently saved, and more surely saved than by the above method, by connecting the upper and lower edges of the girdle with scions, which are inserted about an inch apart all around the trunk. This is known as bridge grafting. The more scions that are used the quicker they will grow together and form a new trunk, but two or three scions successfully grafted on a small tree will carry enough sap to keep the tree alive. A slanting cut is made at each end of the wound in the uninjured wood in which the ends of the scions are to be inserted. Strong, plump scions of the previous season's growth—not necessarily from the same tree, nor even the same variety

---

Mrs J. Hayes, Box 174, Caughnawaga, P. Qué., wants to buy milk goats.

Barrett Made in Canada

Money Savers for Farmers

Seven short appeals to "horse sense"

ANY man can make money by judicious saving. "A penny saved is a penny earned." Think it over. There are certain things you ought to have for farm maintenance. But don't buy the wrong thing at any price or the right thing at the wrong price. Perhaps right now you are in need of a timber preservative, a lice or fly killer, a durable paint for metal and exposed wood surfaces, a satisfactory cement for quick everyday repairs, a ready roofing that is wear-proof, easy to lay and cheap.

We can fit you out perfectly in these things. The Barrett Money Savers have no superiors. Just glance over the products shown below:

ARE you getting all you should from your live stock? Perhaps they are being pestered by insects—flies, lice, vermin. They must be kept clean. Spray your cows and horses with Creonoid. Keep them from insect annoyance. And your hogs will be better if the rubbing posts and swill pails are Creonized. A boon in the poultry house—better hens—more eggs. Creonoid comes in cans of 1, 5 or 10 gallons or in half barrels and barrels. And it's the most economical you can buy. Follow directions carefully.

DO your implements rust? If so, they are decreasing in value. Coat your implements and iron work with Everjet Elastic Paint. You know that carbon paint is best for such purposes. Well, Everjet is the best carbon paint made. Never cracks or peels. Wears like iron. Has a large covering capacity and is extremely economical. Has no equal as a roof paint.

YOU will be glad for the day when you met Everlastic Roofing. Just the thing for all farm buildings. The best "Rubber Roofing" at the price. And the price is low. No excuse for a leak in your roof with Everlastic at your service. It is tough, durable and easy to lay.

EVERLASTIC ROOFING

CARBONOL is a household wonder. It cleans, heals, disinfects, purifies. If you cut your hand, apply Carbonol in weakened solution. If your live stock get bruised, Carbonol will fix them up. If your house, barn or pôultry house needs disinfecting, there is nothing like Carbonol. And it is wonderfully effective as a destroyer of vermin. Carbonol belongs on every farm in Canada.

HERE is a ready roofing that needs no painting or other attention to keep it watertight. Amatite Roofing has a mineral surface that laughs at wind and weather. Very attractive because of its bright sparkling appearance. Wherever you have steep roofs, you need Amatite. Amatite is made in rolls of 110 square feet with galvanized nails and cement in center. Try it!

HERE is a product you should never be without—Barrett's Grade One Creosote Oil. It is the most effective wood preservative on the market. Actual tests have proved that it penetrates deeper and lasts longer than any similar product. A good fence post will last 20 years if painted with Barrett's Grade One Creosote Oil. Use Grade One Creosote Oil and add to the life of all your exposed woodwork.

Barrett's Grade One Liquid Creosote Oil

HERE is the way to make everyday repairs quickly, permanently and cheaply—use Elastigum, the adhesive, elastic and waterproof cement. Whenever you have gutters to join or reline, leaks or joints to seal, cornices to stuff, greenhouse glasses to put in or chimney flashings to renew, Elastigum will be your unfailing friend. Cheap, easy to use and always on the job.

Send for illustrated booklet describing Barrett Money Savers in detail. Address nearest office.
For sale by good dealers everywhere.

THE PATERSON MANUFACTURING COMPANY., LIMITED
MONTREAL TORONTO WINNIPEG VANCOUVER

THE CARRITTE-PATERSON MANUFACTURING CO., LIMITED
ST. JOHN, N. B. HALIFAX, N. S. SYDNEY, N. S.

FOR SALE

ONE farm of 600 acres good fertile land, free from stone, level, for particulars address C E. STANDISH, Ayer's Cliff, Que.

SEEDS 20 Packages High Grade Flower Seeds 5 Bulbs. Pine Tree Nursery, Pemaquid, Me. 10c

FOR SALE—Two registered Holstein bulls, also few calves which will born, next spring. Apply to ALBERIC LAREAULT, Richelieu Village, Rouville Cty, Que.

INCUBATING EGGS—From pure D. C. Red Rhode Island, pure White Wyandottes, coming from good layers. $1.00 per 15, $5.00 per 100. Delivered guaranteed. Also strawberry plants, "Ox Hearts" or Wilson. $1.00 per 100, $5.00 per 1000. Apply to EUGENE CHABOT poultry's raiser, St. Lawrence, Orleans Island.

FOR SALE — Pure bred Chester White pigs which will born about March 15th. Apply to CHARLES TETRAULT, St. Jean Baptiste of Rouville, P. Q.

—cut a little longer than the distance between the slanting cuts, are made wedge-shaped at each end. They are made a little longer than the distance between the cuts in order that when inserting the ends into the cuts it will be necessary to bend them, and thus have them under pressure, which helps to keep them in position. After inserting some of the inside bark of the stock should remain in contact with the inside bark of the scion, as it is here or at the cambium layer where union takes place. As soon as the scions are all placed the wound, especially about the ends of the scions where inserted in the stock, is covered with grafting wax. The ends are also at the same time bandaged with a piece of sacking around the trunk to aid in keeping the scions in place and to exclude the air. The tree should then be well headed back. The scions, if properly made and inserted, should soon unite with the stock and then carry the sap to the top of the tree.

Another method of bridging is to cut back the uninjured bark evenly all around the trunk and insert the wedge-shaped scions underneath the bark at the upper and lower ends of the wound. There are other methods also employed such as using a scion bevelled at each end. Also, boring holes with an auger at each end in the uninjured bark and shaping the scion at each end so that it will fit into it.

One of the most satisfactory methods of utilizing the girdled tree is to cut it off close to the ground and insert a scion of some good variety. This graft should grow at least three feet in height the first season and make a nice young tree.

A tree may sometimes be saved when the girdling is well above the graft by cutting the tree back so as to remove all of the injured part. Under such conditions young trees will usually start fresh growth and the strongest shoot may be selected to form a new trunk and top for the tree.

DEGENERATION OF POTATOES

By H. T. Güssow, Dominion Botanist, Central Experimental Farm, Ottawa

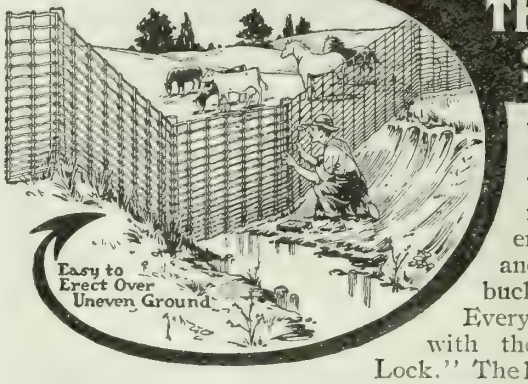
THE question of "degeneration" in potatoes is one that has attracted the attention of practical growers for a great number of years. From the frequent discussions of the subject I consider it reasonable to assume that a belief in the "degeneration of potatoes" is almost an article of the farmer's creed. Quite frequently poor crop yields, susceptibility to disease, and other effects of failure are excused as being due to "degeneration," "running out," "lack of vigour," etc.; these latter phrases, be it noted, being merely circumlocutions for an idea implied in the term "degeneration."

Though this concept of the word by the practical grower and even by the potato breeder is correct, the usage of the term itself appears to, and does actually, involve a fatal misconception of the true inwardness of the term. Hereditary degeneration, i.e., a decline in the progeny due to pre-existent weakness of the parents, is well known, and many examples might be quoted from both the animal and plant kingdoms. In this phrase we imply parentage, and reflect upon the parents either male or female, or both. Let us then use a term, which I am not aware has hitherto been employed, viz., chromosomatic degeneration, as opposed to somatic deterioration, to which I shall presently refer.

Chromosomatic degeneration, or degeneration pure and simple, as we conceive it, is the manifestation of a certain failing or decline transmitted from parents to offspring and perpetuated throughout subsequent generations, or even handed down in intensified ratio to them, until the stock become so greatly enfeebled that sterility or death puts an end to the line. This effect is due to the transmission of inheritable degenerate characters by means of the chromosomes of the parents. These chromosomes are the small bodies in the male and female germ cells, which conjugate in sexual reproduction, and they may be regarded as the "vehicles" of latent or dominant characters both of the male and of the female parents. One example may suffice to interpret to the lay mind the bearing of this somewhat technical exposition. Alcoholism, especially in both parents, will invariably show up detrimentally in the children, and they, being likewise so afflicted, will in turn give rise to mentally and physically feeble progeny. The degenerative taint has been transmitted by the chromosomes of the parents.

Let us, therefore, clearly understand that degeneration is a term which should properly be employed only where sexual reproduction plays a part; hence our use of the qualificative epithet chromosomatic, in order to define accurately the meaning of the loosely used word degeneration.

Now does sexual reproduction enter into the commercial growing of potatoes? No. People who claim that "degeneration" takes place in potatoes clearly confuse the proper significance of the term. Potato varieties originate in the first instance by sexual reproduction. A new variety of potato can only result from cross fertilization of parent plants, which are allowed to set seed, and from this seed the new variety is grown initially. Subsequently the tubers are vegetatively multiplied and perpetuated by their use as seed potatoes for planting. This vegetative mode of reproduction is essentially identical with the methods of raising plants from cuttings, or of perpetuating hyacinths or tulips, for instance, by means of bulbs, apple varieties through grafts, or roses by budding. When the breeder has raised his new variety, and considers it worthy of perpetuation, it has passed through a long series of improvements and



PEERLESS PERFECTION
THE FENCE THAT STAYS "PUT"

PEERLESS Perfection is one of the easiest fences to erect, because it stays "put." It can be erected over the most hilly and uneven ground, without buckling, snapping or kinking. Every joint is locked together with the well-known "Peerless Lock." The heavy stay wires we use prevent sagging and require only about half as many posts as other fences.

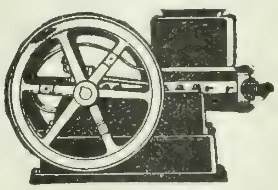
Peerless Farm Fence

is made of the best Open Hearth steel fence wire. All the impurities of the steel are burned out and all the strength and toughness left in. Makes the fence elastic and springy. It will not snap or break under sudden shocks or quick atmospheric changes. Our method of galvanizing prevents rust and the coating will not flake, peel or chip off.

Send for catalog. It also describes our farm gates, poultry fencing and ornamental fencing.

Agents nearly everywhere. Agents wanted in unassigned territory.

The Banwell-Hoxie Wire Fence Co., Ltd.
Winnipeg, Manitoba Hamilton, Ontario



A FEELING OF SECURITY
Of absolute Reliability and Power is Enjoyed by Every Owner of a
GILSON ENGINE
"GOES LIKE SIXTY"
A mechanical masterpiece of the highest type, with our improved simple methods of cooling, governing and sparking. Positively guaranteed, biggest value. All sizes. Save money. Ask for catalogue and prices.
GILSON MANUFACTURING COMPANY
17 York Street, Guelph, Canada 33 10

The Trouble-Proof Roof

A roof that has stood rains, wind storms, and flying sparks for 18 years—the heat of 18 summers—the terrors of 18 winters—and is still giving service—carries its own recommendations.

There are hundreds such Paroid roofs to testify to the durability—yes, and economy—of Paroid Roofing—a roofing that can be well laid by farm help.

NEPONSET
Paroid
ROOFING

Paroid costs less than Shingles and is much the safer roof in case a fire is raging. Burning sparks and flying cinders do not affect a Paroid roof. Paroid is obtainable in Grey, Red and Green, and is the least expensive of all roofs on the only fair basis of comparison—service and satisfaction, and you waste no time repairing a Paroid roof.

Look for the Paroid Roll. By it you will know one of the 2,000 Neponset dealers in Canada.

Our booklet "Repairing and Building" will be sent you upon request—free.

BIRD & SON Dept. J
70 King St., Hamilton, Ontario

The largest manufacturers of Roofings, Wall Board and Roofing Felts in Canada 101

Try Neponset Wall Board in place of lumber or lath and plaster—you'll like it.

Look for the Paroid Roll

selections, and is, *ex hypothesi*, superior at the start to the parents from which it is derived.

The questions which now require to be solved are these. Do these varieties deteriorate, and, if they do, how does deterioration show, and can it be remedied ?

A plant almost exclusively reproduced by vegetative means should not deteriorate; one cutting, one single tuber is just as good, or just as bad, as the plant from which it was taken. A thousand tubers from the same stock should grow in the same way as did the initial parent plant. Here a passing mention must be made of mutation, or the sudden change in some characteristic of an offspring from the corresponding feature in the parent—a phenomenon which has been observed in a number of instances. But the only instance known to us—Labergerie's famous mutation of a white variety into a variety known as Blue Giant, or something very similar—is not by any means authentic enough to be taken into serious consideration.

In so far as chromosomatic degeneration of potatoes is concerned, we know of no single instance, nor have we found any literature that contains authentic evidence in support of such a claim. Indeed one plant breeder of world-wide fame, Professor Fruwirth of Vienna, expresses a view on the subject, which clearly supports our own conception. He says: "True degeneration of a variety, which would manifest itself under uniformly favourable conditions, and when superior seed potatoes are used, has not been proved, and is improbable.

This author cautiously refers to the use of superior seed potatoes, which should be grown under uniformly suitable conditions. "Evidently, then, there is a "degeneration" — some adherents of the doctrine of "degeneration" will exclaim —" if one does not use superior seed potatoes, and raise them under suitable conditions!" A deterioration is just exactly what does happen, but it is no more due to degeneration proper (chromosomatic degeneration) than, for the sake of argument, to mutation.

It is generally claimed by the practical grower that a variety of potatoes, if grown for a longer or shorter period in one particular locality, will eventually give decreased yields, and generally show signs of "degeneration," or "running out." We are able from experience to corroborate this deterioration, but, whenever we have carefully investigated the question, we have been able to prove that such behaviour has been due to a variety of causes. There can be no doubt that certain localities, perhaps because of climatic or soil conditions, will more quickly affect the yielding capacity or vigour of a variety than other localities. Deterioration may also be due to the use for seed purposes of tubers originating in such localities. Indeed the experience of the Dominion Horticulturist at the Central Experimental Farm has shown that Ottawa is a typical locality which affects detrimentally the quality, vigour and type of potato varieties more quickly than has been found the case elsewhere.

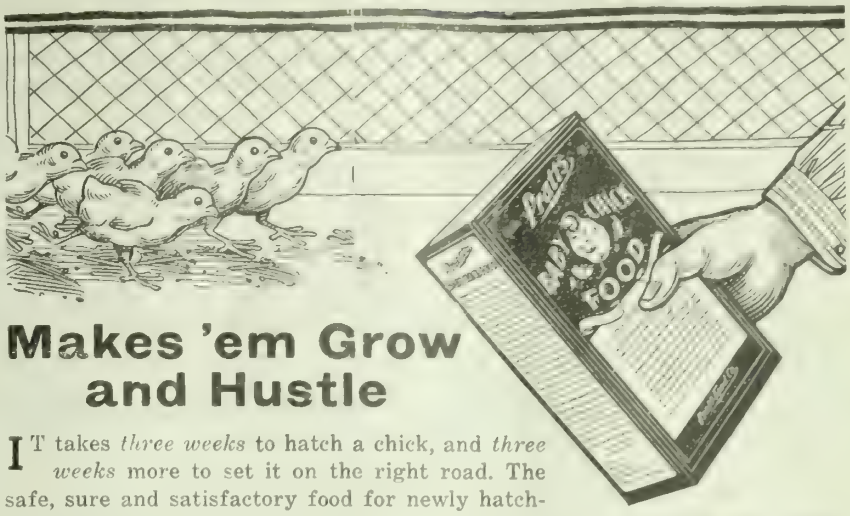
The perpetuation of a variety in such unsuitable localities will gradually result in the production of an inferior type. But experience also shows that it is possible, by patient selection, and above all, by growing these "varieties reduced in vigour" under more suitable conditions, for them to regain their pristine quality and vigour. Is this "regeneration"?

In view of the above explanations we do not consider such cases of loss of vigour in the light of true degeneration, but we have here evidence of a type of decline, which we are inclined to regard as somatic deterioration, as opposed to true or chromosomatic degeneration. Somatic deterioration refers to the decline in the cells of any individual body, or to what is generally, but loosely, spoken of by the practical grower as running out, strain weakness, or "degeneration." It is very distinct from chromosomatic degeneration, since it is not due to any parental imperfection, but is largely due to numerous conditions exerting influence upon the individual.

To use again an illustration, which may bring home to the lay mind the essential difference between this deterioration and degeneration, an analogous case in human life — and one due also to similar unfavourable climatic causes—occurs in the undermining of European constitutions through residence in tropical countries. Is the grower with his "degeneration of potatoes" sufficiently logical to dare to apply the term "degenerate" to, say, our warworn heroes invalided home with broken health incurred from exposure to the damp and cold of trench life in winter ?

It must be realized, then, that a potato plant grown under conditions of starvation will produce smaller tubers than one grown under the most favourable conditions; a tuber produced by the former plant — which tuber is merely a cutting — will produce a very superior yield, if it is grown under the most favourable conditions. Hence the apparent deterioration is not inherited, since a cutting has no true parent plant from which to inherit anything; but it will continue to behave as the plant of origin did, providing the climatic, cultural and other conditions are perfect.

We have mentioned above the decline of varieties due to unsuitable conditions. Continue growing plants under these conditions and you will gradually produce a weak plant offering no resistance to many kinds of disease, and these latter, then, will do the rest. The plant will eventually produce no yield to speak of, and farmers are satisfied that they have a case of "degeneration". We wish to strongly oppose this conception. It is most misleading, and the use of the term is in a fair way to become stereotyped and be used popularly. But it has no bearing upon the true state of affairs.



Makes 'em Grow and Hustle

IT takes *three weeks* to hatch a chick, and *three weeks* more to set it on the right road. The safe, sure and satisfactory food for newly hatched birds is *Pratts Baby Chick Food*. You can feed it for the first three weeks at a cost of only 1c. per chick for the entire period. *Pratts Baby Chick Food* is a perfectly balanced ration for baby chicks, supplying just the required nourishment and relieving the delicate digestive organs from useless strain. Remember, Pratts is *not* a scratch feed. No other Chick Food *can* be "just as good," because Pratts is the *only* preparation of its kind in the world that is 75 per cent. mechanically predigested. Makes the little ones grow and hustle, feather evenly and develop quickly into fine, healthy birds with long, deep, shapely bodies and plenty of vitality to fight off disease.

At your dealer's in 14-lb. bags, $1.00; 6½-lb. pkgs., 50c.; 3-lb. pkgs., 25c.

When Chicks Grow Up back up the good work by giving them

Pratts POULTRY REGULATOR

the one best egg producer and tonic on the market to-day for grown and growing birds. Ensures early maturity. Prevents disease. Keeps the hens active and healthy. Makes them get full value from their feed. *Pratts Poultry Regulator* acts as a gentle but direct aid to digestion, tones up the liver and turns the lazy bird into an active layer. It regulates the blood, bowels and digestive organs, keeps the fowls robust, produces bone and muscle, red combs and wattles, brilliant feathers and fertile eggs. At your Dealer's in 25c., 50c., and $1.00 pkgs., also in larger money-saving sizes up to 25-lb. pails at $2.50, and 100-lb. sacks at $9.00.

WHEN IN TROUBLE

remember there is a Pratt Remedy for every common ailment. Keep a supply on hand. When in doubt, write for free advice of our experts. Every Pratt Remedy is sold under a positive *guarantee of absolute satisfaction or money back.*

POULTRY WRINKLES FREE.

Mail the Coupon below for a FREE copy of Pratts "Poultry Wrinkles" — a 64 page book of real live ideas for use every day in the year. Don't put it off and forget. Tear off the coupon NOW, before you turn this page.

POULTRYMAN'S HANDBOOK.

We have issued a complete guide to Poultry-Raising, well worth $1.00 of any man's money. This book contains 160 pages of clear instructions and 150 illustrations. It shows how to build modern poultry houses; how to feed for profit. It answers many of the puzzling questions that confront both the beginner and the experienced poultryman. We will send it, postpaid, to your address for only **Ten Cents.**

Pratt Food Co., of Canada, Limited
68E CLAREMONT STREET,
TORONTO, CANADA. 27

Pratts Poultry Regulator
Pratts Lice Killer For Poultry
Pratts Poultry Disinfectant
Pratts Roup Remedy
Pratts White Diarrhea Remedy Little Chicks
Pratts New Poultry Wrinkles
THE POULTRYMAN'S COMPLETE HAND BOOK
WHAT TO DO AND HOW TO DO IT
68E

PRATT FOOD
CO. OF CAN.,
Limited, Toronto.
Send Free
Poultry Wrinkles.
. . . .
. . . .

Farmers and potato growers have the remedy for deterioration in their own hands. It is beyond question that some localities in every country are more unsuitable for the growing of good potatoes than others. Where this is the case, growers are urgently advised to make a frequent change of seed. Preferably secure seed from a suitable locality every year, and then the grower will have no deterioration. By keeping one strain of potatoes in cultivation too long under any but the most perfect conditions the yields will be unsatisfactory, and diseases abundant. Even in localities where potatoes do normally well, it is advisable to practise selection of seed along recognised lines. This will eventually result in the production of heavier yields, and produce a strain that will be successful for a longer or shorter time elsewhere. No attempt should be made to grow seed potatoes in unsuitable localities.

THE GREATEST ENEMIES OF AGRICULTURAL PROGRESS

In cooperative circles the disloyal member is the chief element of failure.

It would appear that owing to the very fine principle of mutual help involved, those forming a cooperative organization would be consistently loyal in their mutual relationship. But, on the other hand, unless exceptional care be exercised by the leaders an organization from the beginning will be burdened with drones, cheats, deadbeats, and traitors.

When a grower joins a cooperative organization and then refuses to patronize it, he is a drone. He can not excuse himself even on the ground of bad management, for it is his duty to help secure proper conduct of the business.

If in selling through his organization a producer endeavors to pass off shoddy, poorgrade products, which injure the reputation of the body of which he is a member, he is a cheat.

The member who uses the special and private information of the association in making sales outside, without contributing to its support, is a deadbeat.

The man who joins a cooperative enterprise and then through subtle ways endeavors to obstruct its progress and defeat its purposes, is a traitor.

Those experienced with cooperative organizations have known all these types. They are to be found in practically every community. They are the greatest enemies of agriculture and agricultural cooperation. If allowed to dominate with their dishonest practices, they will sap the energy, brains, and spirit of the officers, exhaust the moral and financial strength of the undertaking, and reduce the whole to a state of miserable failure and ruin.—*Weekly News Letter, U. S. Dept. Agr.*

HISTORY OF THE SILO AND ENSILAGE

From the evidence at hand, we find that the silo has been in use in one form or another from ancient times. Historians tell us that in former times grain was buried in underground pits as a means of saving it or concealing it from marauders. The people in Northern Europe were accustomed to preserve their forage in a similar manner. But not until the middle of the nineteenth century did this practice become general. The leaves and tops of the sugar beet seem to have been largely responsible for the spread of the silo. European agriculturists cultivated this plant for the manufacture of sugar and alcohol, using the beet tops for feeding their cattle, and found that the tops buried in pits retained their freshness and were relished by the stock. This was extensively carried on in France.

M. Reihlen of Stuttgart, Germany, one of the earliest advocates of this practice was the owner in 1870 of a large sugar beet factory. Having great success in the process of the preservation of beet pulp, he was induced to apply it to a crop of green maize (corn) which had come to him unexpectedly. The result was an astonishing success and for fifteen years this process was continued with increasing satisfaction.

In 1877, a French farmer, August Goffart, published a "Manual of the Culture and Siloing of Maize and Other Green Crops," the first book published on the subject. Mr. Goffart is sometimes called the "Father of Modern Silage" as through his publication he brought the value of the silo before the farmers.

Numerous accounts of European experiments were given in our agricultural press and a complete description of the system of the "French Mode of Curing Forage" was given in a paper with that title in the annual report of the United States Department of Agriculture for 1875. Mr. J. B. Brown of New York translated Mr. Goffart's book in 1879 and the next year Dr. J. M. Bailey issued his "Book of Ensilage". These publications and experiences aroused the interest of the progressive American farmer and gradually the silo has become a necessity to successful and intelligent stock farming.

The first silo in the United States is said to have been built in 1876 by M. F. Morris of Maryland, and in 1881 Prof. I. P. Roberts of Cornell University erected the first silo to be used for experimentation. From then on, the interest in silos and silage has increased and at the present time the preservation of green feeds has become of immense value to the stock farmer and dairyman. All kinds of live stock find the silage palatable and succulent. It creates an appetite and stimulates the milk flow.

It is strange that there is still so much ignorance on this subject. Despite the literature and statistics showing the benefits of the silo, the most absurd and unfounded opinions regarding it are entertained. The truth of the matter is that the silo is an invention positively beneficial to stockmen.—*Hoard's Dairyman.*

D & F High-Grade Seeds

To insure "Bumper Crops" this year you cannot be too careful about buying the Best Seeds. Owing to the present war it is expected there will be a tremendous call on our Canadian Market to supply the needs of Europe. All seeds are carefully tested, and our Expert passes nothing but the best producers.

A few of our good things

SEED CORN: Best Flint and Dent varieties for either crop or silo. Canadian grown and will give the largest amount of well matured corn to the acre. Germination tests average over 95 per cent.

ALFALFA, CLOVER AND TIMOTHY: One grade only, the best obtainable. Send for samples.

REGENERATED SEED OATS: Seven splendid varieties. Early and very productive, with grain weighing 40 lbs. and over per bushel. Free of wild oats and noxious weed seeds as defined by the Canadian Seed Control Act.

MARQUIS WHEAT: Winner of $1,000 prize given by Lord Shaughnessy at the New York show for the best wheat grown on the continents of North and South America.

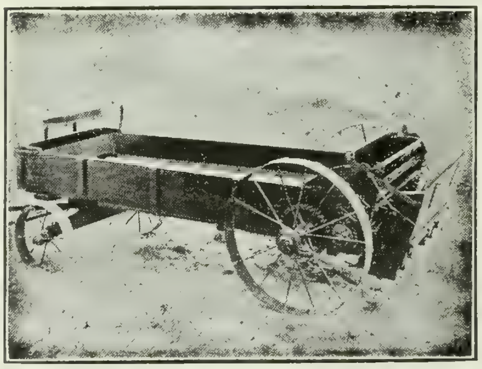
O.A.C. 21. BARLEY: Surpasses other varieties in yield of grain per acre, in freedom from rust and in both length and strength of straw.

SWEDE TURNIP — Ne Plus Ultra: Is the new world famous Turnip, and recommended by Agricultural Colleges as being the best cropper, the best shape and keeper. It is the highest quality swede in cultivation. Dupuy & Ferguson's 1916 Seed Annual Sent FREE for the asking.

DUPUY & FERGUSON,
38 JACQUES CARTIER SQ.,
MONTREAL.

"The JUTRAS"

The only one on sale on the market which is easily operated on ploughed land by two small horses. Ils weight is 1000 lbs. Why are our fertilizers spreaders much superior to the others? The lack of space dont permit us to give you all informations. Write for our catalog dealing on all its important points. You will find also good description of our wonderful evaporator the most rapid in the making of maple products. Sent on trial with all necessary guarantee.



Ask for our catalog and price list sent free on request. Apply to

The Jutras Company,
LIMITED,
Manufacturer
VICTORIAVILLE.
GOOD AGENTS WANTED.

To Modern Bee-masters

FOR SALE—Italian queens and bees, hives, honey-combs guaranteed pure and all necessary supplies to bee-masters. J. O. LEVAC, Rigaud, Que.

INCUBATING EGGS from Barred Plymouth Rocks. Price $5.00 per 100 or $1.00 per 15. Apply to AIME LABINE, Upton, P. Q.

FOR SALE—Hatching eggs from registered Rhode Island. $1.00 per 15. Apply to ANSELME MARCEAU, St-Camille, Bellechasse Cty, Que.

FOR SALE—1100 acres of wheat and hay land, in the south of Alberta. Good terms. Will sell in lot or by particles. For further information apply to Mrs. MARY LACHANCE, Macleod, Alberta.

Assorted and Complete stock of
GRAINS AND SEED GRAINS
Thimothy, clover, Alfalfa, rape, orchard grass, Wheat, barley, oats, ensilage corn, Tares. Land plaster, fertilizers.
Specialities for Farmers' Clubs.
J. B Renaud & Co. Reg., 104-150 rue St-Paul, QUEBEC

A H

The JOURNAL of AGRICULTURE

AND HORTICULTURE

Volume 19 *May 1st 1916* *Number 11*

A MONEY MAKER ON THE FARM.

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

Made in Canada.

Tarvia

Preserves Roads
Prevents Dust

Good roads at low cost—

Tarvia roads are not an experiment—they are well and favorably known in hundreds of towns in the Dominion.

Taxpayers in such communities are favorable to the use of Tarvia because it relieves them from the dust nuisance and gives clean, easy-traction, automobile-proof highways.

The use of this material in road construction is also a real economy, because the reduction in maintenance expense more than offsets the original cost of the Tarvia.

Tarvia roads are an asset to the community. They invariably mean — increased property values, more acessible markets and reduced transportation expenses.

As more and more taxpayers realize that at practically no extra expense they can secure waterproof, dustless and automobile-proof roads, more and more towns will build most of their highways with Tarvia exclusively.

If you want better roads and lower taxes, our Special Service Department can greatly assist you. Write to nearest office regarding road conditions or problems in your vicinity and the matter will have the prompt attention of experienced engineers. This service is free.

Write our nearest office for free illustrated booklet.

THE PATERSON MANUFACTURING COMPANY, LIMITED
MONTREAL TORONTO WINNIPEG VANCOUVER

THE CARRITTE-PATERSON MANUFACTURING CO., Limited
ST. JOHN, N.B. HALIFAX, N.S. SYDNEY, N.S.

Government Parkways, Ottawa, Canada. Treated with "Tarvia-B".

A1

Little Miss MAIDEN CANADA Registered

My Birthday Party To-morrow, Daddy!

Watch the extra sparkle in the eyes of children—the clapping of the hands and the delighted laughter when Maple Buds are served at the party. Let them eat plenty—they are not harmful in any way; in fact they contain the finest and most expensive cocoa beans, rich, creamy milk, and the best selected sugar blended skilfully.

Grown-ups relish them too—you know that yourself.

COWAN'S MAPLE BUDS

A dainty Solid Chocolate

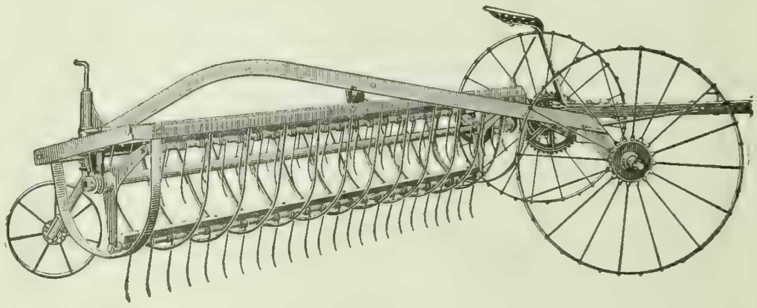
A-51 Name Reg.—Design Pat.

Good harness deserves good care; keep the trimmings clean and bright with

Old Dutch

Deering and McCormick Light Draft Hay Tools

All Steel Side Delivery Rakes and Hay Loaders



Don't miss seeing the line of all-steel side delivery rakes and hay loaders the DEERING or McCORMICK local agent can show you. These strong, light weight, light draft, all-steel machines do such good work and last so long that they are the cheapest haying machines you can buy

The all-steel side-delivery rakes, while light in weight and easy on horses, are strong enough to handle the heaviest crops. They have every adjustment needed for good work in the field.

Buy a hay loader with a light draft, all-steel frame; with a steel forecarriage; with no gears or drive chains; one that gathers up a six-foot windrow and piles the load ten feet high—that's the kind the DEERING and McCORMICK local agents sell.

Buy DEERING or McCORMICK hay machines, mowers, dump rakes, side delivery rakes and hay loaders. They take the hard work out of haying and put the profit in. Get catalogues from the local dealer, or write for them to our nearest branch house.

International Harvester Company of Canada, Ltd.
BRANCH HOUSES
At Brandon, Calgary, Edmonton, Estevan, Hamilton, Lethbridge, London, Montreal, N. Battleford, Ottawa, Quebec, Regina, Saskatoon, St. John, Winnipeg, Yorkton

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 90,067
ENGLISH, 7,397
FRENCH, 82,670

Volume 19 | MAY 1st 1916 | Number 11

EDITORIAL

To the Secretaries of Agricultural Societies and Clubs

LISTS OF SUBSCRIBERS TO THE JOURNAL OF AGRICULTURE

To prevent any irregularity in the delivery of the "Journal of Agriculture" to the members of Agricultural Societies and Clubs, you are earnestly requested to inform us as soon as possible of the changes occurring this year among the members on your respective lists; that is to say, the names and addresses to be added or left out.

Until you inform us of these changes the Journal will be distributed according to the old list of subscribers.

The list of the names to be added or cut out must be forwarded before the coming month of July, the date of the next subscription year of this Journal, to Mr. OSCAR LESSARD, Sec., Council of Agriculture, Dept. of Agriculture, Quebec.

STANDING CROP COMPETITION FOR 1916

To further encourage the production of high class seed grain, the Minister of Agriculture of the Province of Quebec hereby offers a special grant to the Agricultural Societies which have decided to hold, in 1916, competitions respecting standing crops.

The main object of this special grant is:

1. To stimulate the farmers in the growing of choice seed grain;

2. To encourage the practice of growing seed for next year's crop apart from the main crop, using only the best seed obtainable, sowing it on the best prepared and cleanest land, allowing it to thoroughly ripen, and threshing and storing separately;

3. To obtain pure grain, i. e. free from other varieties, the presence of which can best be detected when the grain is growing;

4. To encourage the use of seed from heavy yielding strains;

5. To promote the sowing of seed from clean, vigorous crops of uniform stand and with bright stiff straw, in the case of smaller cereals;

6. To encourage careful and intelligent farming and the production of grain free from weed seeds.

REGULATIONS GOVERNING THE COMPETITION

1. *Nature of Competition.* Competition shall be limited to one crop, to be selected by a farmers' society in the district. Entries must consist of a field not less than three acres, and where potatoes and timothy are entered the minimum plot must be not less than one acre.

Selection must be made from the following crops, viz: wheat, oats, barley, corn, peas, clover, timothy and potatoes.

2. *Competitors.* Competitions shall be limited to the members of Agricultural Societies. Competitors shall be allowed to make entry in only one society and but one entry can be made by each competitor.

3. Societies desiring to enter this competition must notify the Secretary of the Council of Agriculture before the first of May, and must not make more than 25 entries.

4. The list of competitors shall be transmitted to the Secretary of the Council of Agriculture before the first of July.

5. Societies must charge competitors an entry fee of not less than 25 cents and not more than one dollar.

PRIZES TO BE AWARDED

The Department of Agriculture will grant $75. to each of the societies above mentioned; this special grant will be employed in paying prizes not less than $20, $15, $12, $10, $8, $6, $4. The grant will be equal only to the amount paid for prizes, if it is below $75. Prizes will be awarded by the judges only to fields deserving such prizes. The fee received with the entries will be equally divided amongst the successful competitors, besides the special grant above mentioned.

If the number of competitors is less than ten, the prizes will be as follows:—1st $10, 2nd $8, 3rd $6, 4th $4, 5th $2, 6th $1.00.

The plots will be visited by judges appointed and paid by the Department of Agriculture of Quebec, and the Secretaries of the Agricultural Societies who organize such competition must advise the Secretary of the Council of Agriculture, at least 8 days before the contest is held, of the dates when the judges will be required.

It is important that the list of competitors be sent in on or before the first of July, 1916.

J. ANTONIO GRENIER,

Deputy Minister of Agriculture

BACON-HOG CONTEST

Open to young Boys

In order to further stimulate the interest in the raising of hogs in the Province of Quebec, the Minister of Agriculture has decided to hold a contest, particulars of which are given in this issue.

The Department of Agriculture realizes that there is a great future before the farmers of Quebec if they will raise hogs properly, and with this in view is holding this contest with the purpose of interesting the boys and girls on the farms in the raising of swine. It is also hoped that as a result of the contest a better knowledge may be obtained of the "bacon type" of hog, which it is necessary for Quebec Province to raise if success is to be obtained.

A few points in connection with this contest are worth repetition. A study of the rules and regulations will show that the contest begins after the pigs have been weaned at the age of 6 weeks. As each contestant has only to exhibit two hogs (see rule 4), although he can feed three, it is important that particular attention be given to the selection of the hogs which he is going to feed, that is, the contestant will be wise to take care that he seelcts the best-looking three pigs out of the litter, so that he may have a good start.

Rule 6 states that there will be no restrictions in the competition as regards breed, but in connection with this it should be remembered that the competition is for the best bacon hog, (see rule 8) and therefore in selecting his hogs the contestant should be sure that the ones he selects will conform to this type. If a contestant is not absolutely sure what is meant by the "bacon hog", it would be well for him to write to the Department for full information concerning it. Articles have been published from time to time in the "Journal of Agriculture" covering this point.

The Department of Agriculture has also issued a bulletin, No. 18, which describes fully on page 20 the type required, and a copy of this can be had by writing to the Minister of Agriculture.

Clause 7 provides that an accurate account must be kept of all feeds. This is very important, and in giving the prizes this record will be taken into consideration.

The Minister of Agriculture hopes that there will be a large number of entries into this competition. All will agree that the prizes which he has offered are very handsome indeed, and every assistance will be given by the Department to any contestant who is not sure just what is required. If there is any point on which further information is desired, a letter adressed to the Department of Agriculture, Quebec, will bring a full reply.

RURAL NEEDS

The rural problem has been discussed frequently by economists in all civilized countries of the world. It is not a new problem, but it is one that changes with local, national and international conditions. The problem in Canada is not the same as that in Denmark or Ireland, and the solution must necessarily differ to some extent in its adaptation to different countries.

In general, however, it may be said that the fundamental need of all rural communities is alike, which is that *Rural Life must be satisfying, both financially and socially.* To accomplish this desired end a broad and comprehensive rural organization that will put the farmer in proper relationship

CONTENTS

EDITORIAL: — Lists of Subscribers to the Journal of Agriculture. — Standing Crop Competition for 1916.—Bacon-Hog Contest.—Rural Needs.—Notes by the Way.—An English Experiment in Rural Education.

ORCHARD AND GARDEN:—Potato Importations from Canada into the United States. —Spraying Problems.—Window and Porch Boxes. —Spring Care of Bees.—Annual Meeting of the Quebec Society for the Protection of Plants.—Plant Pests.—Donations of Maple Products to Red Cross Hospitals.

FARM AND FARM CROPS: — The Alfalfa Crop.—Lightning Rods. — Soils Tests for Farmers. — Treat Seed Oats for Smut.—Homemade Lightning Rod.

LIVE STOCK:—Prizes for Fleeces of Wool.—Howick - Huntingdon Ayrshire Breeders' Club.—Dundas-Grenville Ayrshire Club. — Canadian Ayrshire Breeders' Association.—Officers of Local Wool Growers' and Sheep Breeders' Associations for 1916.—A little Experiment in the Feeding of Pigs.—Rules and Regulations for Bacon-Hog Contest.—The Rearing of the Calf and Heifer.—Chronic Bloating of Bull. Joint-ill of Colts.—Abortion in Cows.—Portable Hog-house.

DAIRY:—Machine Milking a necessity. — The Testing of Dairy Products.—An Objective Point. — Intelligent Selection. — Turn Waste to Profit.

POULTRY: — Poultry Queries. — Shade and Green Food for chicks.—Breaking up broody hens. — Poultry Department extension work.—Vampires of the Poultry house.—Profitable breeds for farmers.—Preservation of Eggs.

WOMAN'S WORLD:—Foods and Food Preparation, contd. — Cooking Demonstrations in the Schools. — Quebec Homemakers' Club. — Food for Children.

GENERAL INTEREST:—Annual Flowers.—What We need as Farmers.—The School and Farm of the Future.—A Legend.—Look for your Money where you lost it.—Fumigating for Fungous Pests and Bad Odours.—The Importance of Phosphatic Fertilizers.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

with his neighbors is necessary. This organization must be built up from the bottom rather than down from the top. It must represent voluntary co-operative effort on the part of the farmers themselves. This does not mean that outside agencies may not help to bring this about; indeed, we believe that much educational work of a special kind will be required before the people of most rural communities will abandon independent individual effort for concerted co-operative action. We are of the opinion, moreover, that agricultural demonstrators or representatives are the best agents in an educational campaign of this nature. Already in some counties where these men have been at work a distinct improvement is noticeable, and the farmers are forming organizations for their mutual advantage.

As the spirit of organization grows, adequate schools, roads and other things will appear as expressions of community development. Rural credit systems will also arise if bankers are not disposed to give farmers the same treatment as they give to the town and city business man. Government philanthropy beyond a limited extent is not in the best interests of the community.

The work of rural organization should begin at once and not be deferred until the war is over.

NOTES BY THE WAY

OAT SMUT

FARMERS should not forget to treat their seed oats before sowing with formalin solution for the prevention of smut. The treatment is cheap and simple, and the result is a crop free from smut. If you do not know the method of treatment, read what is said about it on another page.

* * *

PRODUCTION AND THRIFT

The Federal Government has initiated a campaign on "Production and Thrift". Canadians have scarcely felt the pinch of war and have made practically no effort to economize. Perhaps a sudden jolt will come some day, and we will be compelled to practice economy and thrift with a vengeance. Now is the time to give up luxuries and unnecessary articles, for by so doing we will be doing ourselves and our country a real service. It is wonderful how many things we can do without and yet live comfortable lives.

* * *

WASTES ON THE FARM

Talking about economy on the farm reminds us that many farmers are very wasteful regarding many important substances. Take, for example, *waste of manure*. We find by observation that there are too many cases where manure is left exposed in the barnyard until one-half to three-fourths of the fertilizing elements in it have disappeared. Fermentation and leaching are responsible for large losses every year. Both of these can be prevented by the use of litter for absorbing the liquid portion, by firmer packing of the manure in the yard, and by hauling out the manure early and spreading on the field.

Other wastes on the farm are *poor management*, when the labour is not expended to the best advantage; and the *use of antiquated instead of labour-saving implements*, involving more horse-labour. In these days of scarcity of farm help two extra horses can often take the place of a man.

* * *

UNDER-DRAINAGE

The advantages of *under-drainage* of land are becoming more apparent every year. Not only is drained land more easily worked, but early seeding is made possible, and larger crops are produced.

* * *

RISE IN PRICE OF COPPER SULPHATE

The increased price of blue stone or copper sulphate, owing to the great demand for copper for munitions, will prevent its use as a spraying material to some extent. The orchardist can get along without this substance, for he can rely upon arsenate of lead and lime-sulphur to control most of the worst insect and fungous pests. Potato-growers, however, require copper sulphate to control late blight, and they cannot afford to neglect spraying even at a greater cost.

* * *

CARE OF THE ORCHARD

ORCHARDS, as a rule, are neglected in Quebec. From the time of planting until the trees die proper care is seldom given. We have frequently seen fine nursery trees planted in land needing draining badly, plowed once from sod and left unplowed for years. The condition of such an orchard of trees may be readily imagined.

Our last issue contained a timely article on the care of the orchard, in which detailed information was given regarding spraying and pruning. The orchardist cannot hope to get a crop of good fruit without spraying and pruning, so we would urge our readers to re-read the article in the April issue of the Journal.

AN ENGLISH EXPERIMENT IN RURAL EDUCATION

CAN any good thing in education come out of England? The superficial critic and an uninformed opinion would answer decidedly—"No!" England has usually been considered the land of classics and games, just as Germany is considered the land of scientific education and research, and France, the country for literary education and examinations, but for some years the English Board of Education has maintained a special director for foreign inquiries and reports, whose writings and pamphlets have stirred educational enthusiasm and imitation so that many good things found practical in other countries have been adopted and incorporated in the English system. The war, also, is making educational authorities pause and consider the advisability of introducing practical work in the schools. As a result one of these experiments, which has proved successful, is now itself the subject of a pamphlet published for the information of every local authority.

In a certain rural community, there was a disused grammar school, the buildings and premises of which were altered and adapted to a new purpose. The expense was very small and the school became a rural centre for special subjects of a practical nature. Eight village schools in the neighbourhood within a radius of six miles send the boys and girls in attendance to this central school in brakes or buses. These children spend one day each per week in practical subjects such as gardening, mensuration, nature study, and handicrafts for boys, while the girls are taught laundry work, cookery and household management. The scholars number altogether about 180, the boys and girls being almost equal in numbers. Thus for one day each week these 180 boys and girls receive instruction in practical subjects, which they could not receive in the small village schools.

The cost of alterations to the schoolhouse was defrayed from the endowment of the ancient foundation and a yearly sum of $575 was allocated for maintenance and salaries. The cost works out at an average of $11.50 per scholar and of this expense conveyance is a very heavy item, accounting for one third of the total cost, but inspectors, head teachers, governors of the centre and parents of the pupils are convinced that the experiment is a success and that each pupil receives more than $11.50 worth of extremely valuable instruction.

The Subjects of the Course

The following selections from the report will give some idea of the extent and nature of the work done in the school:—

"The boys do practical drawing and mensuration, and have practical instruction in nature-study in the school garden in addition to handicraft; and the girls do housework which can be spread over the whole day.

"The girls learn laundry work in the first three months of the first year they attend the centre, cookery during the next three months, and a mixed course completes the year's instruction.

"The specialised knowledge gained in the first year's attendance at the centre is applied in the household management course of the second year, where the special processes of cooking, washing, and ironing are performed in their right place, along with other housework, as part of the general routine of the home.

"The course includes instruction in the best, quickest, and most hygienic methods of cleaning a house and keeping it clean, and the organization of this work by the day and week and on special occasions. The instruction aims at bringing about order, freshness, and sweetness in the home. The girls are also taught how to choose and keep in good condition furniture, floor coverings, bedding, and everything used in a house. Simple upholstery, which will help them to mend their own furniture and keep the covers in order, is included in the syllabus. They are all also taught how to make the best use of remnants, how to renovate old clothes, how to keep household accounts, and how to spend money to the best advantage. Instruction is further given in the care of a baby, and in the preparation of its food.

"The curriculum for the boys is of a very useful rural character. Measurements, drawings, and calculations are made from objects of all kinds, both indoors and outside, leading up to the estimation of the volumes of such objects as haystacks, timber, milk-churns, etc., and the surveying of fields.

"The nature-study is largely taken out of doors and is principally concerned with forestry, gardening, and beekeeping, all of which have a very definite bearing upon the occupations of the neighbourhood. The boys also learn how to graft and bud, and to propagate the common garden plants and fruit trees.

"The handicraft is chiefly work in wood and metal. The work includes repairing cupboards and bookcases, fixing curtain rails, etc., and repairing objects brought from home, such as leaky funnels and oil-cans.

"The co-operation between the teachers of the domestic and manual centres is also an excellent feature; the boys greatly appreciate the share they are taking in furnishing the house, and the girls will no doubt think more highly of the articles their brothers have made than of those provided by the authority.

"There is no question that the children take the keenest interest in the work. The weekly journey is an incident in their often monotonous lives, their minds are broadened by contact with fresh teachers, and they feel that the work they are doing is useful at home and after they leave school. It is satisfactory to find evidence that some of them are already applying at home the work they have learnt at the centre. The girls are allowed to take a more responsible share in the home, and the boys make or mend articles for their parents in their spare time."

Results

Certain very interesting facts emerge from all experiments of this nature. In the first place, as in the case of the village school at Ednam, the intelligence of the scholars has been greatly stimulated. The day spent in practical work at the centre has not lowered the efficiency of the other school subjects taught and it has been found that although time has been taken away, the children are more interested both in their regular work and in the practical subjects and give greater attention to their studies in both schools. There is also distinct proof that things that are really useful for future citizens and of value in their everyday work as adults can be taught in a schoolroom so as to be educative in the highest sense of the term.

In the second place, it has indirectly raised the leaving age, for there are several children of fourteen still attending school, who would, in the ordinary course of events, have left school at the age of 13, because children are anxious to stay to finish their practical course. In fact, the children and their parents are keen to take advantage of instruction in subjects which are well known to be profitable and useful. Even the headmasters of the village schools are enthusiastic and feel no falling off in the attainments of the pupils in all of the essential subjects.

The governors or trustees, among whom there were some doubters as to the advisability of the experiment, are unanimous in their support of the scheme now that experience proves it has been a success and, of course, the pupils are favorable also.

The Board of Education, which usually can only proceed as fast as public opinion will be willing to follow, is anxious to have this experiment imitated by every local authority and suggests that every trustee of rural charities might well follow the lead of this centre. Naturally, of course, modifications will have to be made to adapt the scheme to the needs of each locality and it has been found that town and country require separate treatment. For instance, rural communities might easily combine to provide a centre to serve several schools and, in the city, facilities might easily be provided at one or more individual schools to serve the needs of the neighbouring schools. This is actually done in the City of Montreal where, in Mount Royal School, Manual Training and Cooking teachers are employed to give instruction also to the pupils of Strathearn School; and the same is true of Aberdeen School, which provides the same facilities for the pupils of Alexandra School in addition to its own.

In Scotland the School Board of Dundee built a school containing a suite of apartments for teaching Domestic Science and Household Management and installed equipment for teaching wood work and metal work and elementary mechanics to children between the ages of 12 and 14. In this school there are no pupils below the age of 12 and it is, therefore, a technical school for public school scholars. Experience shows, therefore, that improvements which would be expensive in every individual school would not be expensive if the cost covered the teaching of pupils from several schools.

The lesson from this English experiment is very clear. The general trend is towards practical work in schools, even in countries that are conservative in nature and slow to change. It takes a long period of education and agitation to introduce experiments, but the success of one makes others possible and a world upheaval will force their introduction on other more cautious communities.

SINCLAIR LAIRD

THE GARDEN AND ORCHARD

POTATO IMPORTATIONS FROM CANADA INTO THE UNITED STATES

Permitted if Free from Disease

THE United States Secretary of Agriculture has authorized the granting of permits to import potatoes from Canada, subject to the new regulations, which became effective January 1, and the Canadian government has officially accepted the conditions and issued an order that potatoes offered for export to the United States must be free from injurious diseases and insect pests.

With this understanding the Canadian potatoes will be exempted from the requirement of inspection and certification before shipment, which still applies to European potatoes.

The potatoes from Canada will, however, be inspected on arrival in the United States, and entry will be refused to any shipment of potatoes badly infested with disease, even though the disease is one which may already occur in the United States, such as common scab, dry rot, powdery scab, fusarium wilt, and black leg. A negligible percentage of these common diseases will not bar admission, as it is recognized that the shipment of potatoes absolutely free from some of them is not commercially practicable.

Under this arrangement those desiring to import potatoes from Canada must apply to the Federal Horticultural Board, at Washington, for a permit, stating in the application the name and address of the exporter, the locality where grown, the port of departure (or port of consular invoice), the proposed port of entry, and the name and address of the importer in the United States to whom the permit should be sent.

Potatoes will be inspected by the U. S. Department of Agriculture on arrival, and should it prove that Canadian shippers are not complying with the regulation of the Dominion Government, that "Potatoes offered for export to the United States must be free from injurious diseases and insect pests", the permit of the offending shipper may be revoked.

SPRAYING PROBLEMS

Editor, Journal of Agriculture.—

WHICH would you advise us to use in spraying an apple orchard, the Lime Sulphur and Arsenate of Lead, or the Soluble Lime Sulphur and the Dry Arsenate of Lead, and when should we spray.

ANSWER:—There is no Soluble Lime Sulphur, but you probably refer to the Soluble Sulphur spray which is a sodium sulphide and different in composition from the lime sulphur, a calcium sulphide made by boiling unslaked lime and sulphur together for an hour. The Soluble Sulphur is frequently recommended to take the place of lime sulphur for the orchard as it is a more convenient spray to handle. The claim for the Soluble Sulphur is largely that it destroys the San Jose Scale, and as this pest does not occur in Quebec, we do not have to spray for it. Also the Soluble Sulphur is a control for apple scab, but it is known that under some conditions, especially when combined with Arsenate of Lead, it causes serious injury by "burning" the foliage and fruit, so that it is unsafe to use it in combination with the lead at any time.

The Lime Sulphur aids in the control of Oyster Shell Bark Louse, destroys many of the egg clusters of the tent caterpillar, aphid eggs and probably some minor pests and is also a control for the apple scab. It can be safely used with the Arsenate of Lead, in fact experiments show that the one increases the value of the other when combined.

The dry Arsenate of Lead is a more convenient lead than the paste Arsenate, but it is an acid lead and although no experiments are completed as to its value with Lime Sulphur one should use it only with caution. The paste Arsenate of Lead has given good satisfaction and is recommended in preference to the dry form, until experiments have conclusively shown that the dry form is as good as the paste form in all respects.

For the province of Quebec the following three sprays are recommended and are essential for thorough work:

First Spray—Time, just before growth starts in the spring.

Materials, Lime-Sulphur 1.03 sp. gr. or 1 gal. commercial strength L. S. to 10 gals water.

Pests destroyed, scale insects, apple scab and some aphid eggs, tent caterpillar eggs and budmoth larvae.

Second Spray—Time, just after first leaves open and before the blossoms open. Never spray when trees are in bloom.

Material, Lime Sulphur 1.009 sp. gr. or 1 gal. commercial strength L. S. to 35 gals. water with lead arsenate (paste) 3 lbs. to every 50 gals.

Pests destroyed, apple scab, budmoth worm, tent caterpillars, canker worms, etc.

Third Spray—Time, immediately after the blossoms have fallen.

Material, Lime Sulphur 1.008 sp. gr. or 1 gal. commercial strength L. S. to 40 gals water adding lead arsenate (paste) 3 lbs. to every 50 gals.

Pests destroyed, apple scab, codling moth, fruit worms, etc.

A fourth spray if necessary is given two to three weeks after the third spray and is of the same material as the third spray.

If aphids or plant lice appear add Black leaf 40, ½ pint to 40 gallons. This can be applied with either the second or third sprays.

T. G. BUNTING

WINDOW AND PORCH BOXES

NOW is the time to think about making window boxes, for when artistically arranged few objects are more attractive. A window box serves two purposes—it renders a house more attractive to the eye of passers-by, and on the other hand it brings to the occupants renewed suggestions of the beauties of the outside world.

The window box should be at least 10 inches wide, and 6 to 10 inches deep, made of boards one inch thick and any desired length. The boards should be nailed securely together and it is necessary to bore holes in the bottom of the box about six inches apart to allow the surplus water to drain off. Pine wood is the most durable, but other kinds will serve the purpose equally well. The box should be painted inside and out, green being the colour most commonly used. It should be supported by iron or wooden brackets.

Preparation of the box

Place some broken crocks over the holes in the bottom of the box, add about one inch of cinders, covering with leaves, moss, or any other coarse material; this will provide ample drainage. Fill the box to within two inches of the top with good rich soil, when it is ready for planting.

Planting the box

What to plant requires consideration, for plants that will grow with a Northern exposure will not do well when facing south. North boxes should be planted with foliage plants such as Boston fern and its varieties, asparagus fern, or any of the foliage plants that are usually grown in the home. If such plants are not at hand they may be purchased from a florist, as they are well established and can be transferred with little or no check. German ivy, vincas or nasturtiums may be used for trailing over the side of the box. An eastern exposure is ideal for many kinds of plants, as they receive the morning sun and are protected from the scorching midday sun. One of the most attractive plants for this exposure is antirrhinum or snapdragon; there is great variety of colours and it is a matter of taste as to which are chosen. Heliotrope, verbena, petunias and coleus may be used to advantage, and such plants as vinca, tradescantia, nasturtiums, German ivy make excellent trailers. Wild cucumbers are also good, and can be used as a climbing or trailing plant. Great care must be taken not to overcrowd the plants.

For a south exposure the best plants are those that require plenty of sun, and we know of nothing better for this purpose than geraniums, which seem to adapt themselves to all conditions. Most of the trailing plants will also grow in this exposure, provided they are given plenty of water.

Porch boxes

Porch boxes may be placed all around the porch, and are very effective as screens. Wild cucumber is very useful in this connection; it can be run upon wire netting and allowed to trail down, forming a beautiful screen. Other vines may be used in the same way.

Plants for the porch boxes depend on the exposure of the porch, and as most porches have a southern or western exposure flowering plants should be selected. A box filled with geraniums, with two or three foliage plants such as dracaena indivisa etc., is most effective.

Great care must be exercised when planting. Geraniums should be planted about 1 foot apart, and the other plants mentioned above about 9 inches apart. It is necessary to plant fairly closely as the blooms are most attractive in mass than in any other form. It is also very necessary to give the plants plenty of water during the summer months, for if the box is allowed to dry out it will certainly prove a failure.

E. H. JONES

SPRING CARE OF BEES

By E. F. Phillips

Provide Room for Brood Rearing, an Abundance of Food, and Protection from the Weather

THE duty of the beekeeper in the spring is to get plenty of bees in time for the honey flow. If this is not done his work is a failure. The population of the colony is reduced during the winter, especially where wintering conditions are not the best, and this must be corrected if the colony is to get the full honey crop. It is poor beekeeping to have weak colonies at the beginning of the honey flow from which the surplus crop is obtained.

After brood rearing gets under way, bees need three things: Room for heavy brood rearing, an abundance of stores, and protection. A common error is to cramp the colony by failing to provide empty cells for the reception of eggs. Each colony should ultimately have the equivalent of at least eight Langstroth frames entirely full of brood, so that even a single 10-frame hive is scarcely large enough at this season. Some beekeepers practice giving a second hive body during this period of heavy breeding. This is especially necessary for colonies that have abundant stores.

If in early spring the weather is suitable and if nectar is available, the bees will add considerably to their hoards of honey, but they use it so rapidly that it is seldom that any gain in the stores occurs even during fruit bloom. However, since the weather is uncertain at this season, the beekeeper should not depend too much on incoming nectar to supply the needs of his bees. If they are short of stores, feed a warm thick sirup made of granulated sugar and feed lavishly. This will be stored by the bees in the brood combs and used as needed. The sirup may be half water and half sugar, or thicker if preferred. There is no better investment in beekeeping than to give abundant supplies in the spring.

Bees generate considerable heat in rearing brood rapidly, for the temperature of the brood must be maintained nearly at human blood heat. The better they are protected from winds and the more insulation they have, the easier it is for them to keep the proper temperature and the faster they build up.

On some warm day the hives should be opened and given a spring house cleaning. At this time one wing of the queen should be clipped so that when swarming time comes she can not fly to the woods with the swarm. If any queenless colonies are discovered (having no brood) they should be united with colonies having queens. This can be done simply by setting the queenless colony on top.

The stimulation to heavy brood rearing should occupy six to eight weeks previous to the surplus honey flow, and every beekeeper should know when that comes in his locality. If he is a beginner, any beekeeper who is older in the work can give that information. If a colony has a good queen and plenty of empty cells for egg laying, is well supplied with stores, and is protected from cold and wind, one may expect a colony which is capable of storing the maximum crop.

Having gone to all this trouble to get plenty of bees in the hive the beekeeper will readily see that he should do everything in his power to prevent swarming. Swarming just before or during the honey flow is the greatest drawback to a good crop. Experienced beekeepers have worked out methods by which this can largely be prevented and every beekeeper should study these methods.—*Weekly News Letter, U. S. Dept Agr.*

ANNUAL MEETING OF THE QUEBEC SOCIETY FOR THE PROTECTION OF PLANTS

THE Eighth Annual Meeting of the Quebec Society for the Protection of Plants was held in the Biology Building of Macdonald College on Tuesday March 14th 1916. There was a large attendance of delegates, among whom were Dr. R. Matheson of Cornell University; Messrs J.C. Chapais, St.-Denis-en-bas; G. Bouchard, Ste. Anne de la Pocatière; Father Leopold, Professor Letourneau and Bro. Benjamin of Oka Agricultural Institute; Messrs A. Gibson and J. M. Swaine of the Entomological Branch, Ottawa; Messrs W. A. McCubbin and P. Cowan of the Botanical Division; A .F. Winn, G. A. Moore, Lachlin Gibb, Holmes of the Montreal branch; Rev. Dr. Corcoran of Loyola College; Fathers Fontanel and Goucie of St. Mary's College.

A large number of members of the staff and students of Macdonald College were present at both sessions.

At the meeting of the executive the following officers for the coming year were elected:—

President: Professor W. Lochhead, Macdonald College.

Vice-President: Mr. Auguste Dupuis, Director of Fruit Experiment Stations, Village des Aulnaies, P. Q.

Secretary-Treasurer: Mr. J. M. Swaine, Assistant Entomologist for Forest Insects, C. E. F., Ottawa.

Curator and Librarian: P. I. Bryce, Assistant in Biology, Macdonald College.

Directors : Revs. Dr. Thomas Fyles, Ottawa; Father Leopold, La Trappe; Bro. Victorin, Longueuil; Prof. Fontanel, Montreal; Abbé Huard, Quebec; Messrs A. F. Winn, Montreal; G. Chagnon, Montreal; W. P. Fraser, Macdonald College;

The home of Mr. Peter Reid, the worthy Secretary of the Quebec Pomological Society, at Chateauguay Basin.

G. Bouchard, Ste. Anne de la Pocatière.

Auditors: E. M. DuPorte, Dr. Hamilton, Macdonald College.

Delegate to the Royal Society of Canada: Professor Lochhead.

Delegates to the Ontario Entomological Society: Mr. J. C. Chapais, Father Leopold.

The following resolutions were passed at the meetings:—

(1) That on account of the great damage done to orchards by various canker diseases it is necessary that a study of these cankers be made at once. The Society asks that the Provincial Department of Agriculture take the necessary steps to appoint an expert on this work.

(2) That the usual grants are available for the compilation of lists of insects and fungi of Quebec by members of the Society who are willing to undertake the same.

(3) The Society places on record its appreciation of the great work of the late Henri Fabre, the eminent entomologist of France, who died October 11th 1915. His great work "Les Souvenirs Entomologiques"' will for all time be an inspiration to workers among insects.

At the general meeting at which the President, Professor Lochhead presided, Dr. Harrison welcomed the delegates and hoped that the meeting would be a very successful one. He congratulated the province on having such a society within its borders on account of the excellent work it was doing. Father Leopold gave an account of the proceedings of the annual meeting of the Ontario Entomological Society at Ottawa last November. Mr. A. Gibson of the Entomological Branch, Ottawa, described clearly the work of the Entomological Branch with its field stations in the diferent provinces. He also described the experiments carried on under his supervision for the control of grasshoppers during the past two seasons. Mr. E. M. DuPorte of Macdonald College gave an account of the injurious insects of the season 1915. Mr. W. A. McCubbin, located at the field station at St. Catherines, gave a very interesting and timely address on the Pine Blister Rust in Ontario, a disease which attacks the white pine. The alternate hosts for this rust are currant and gooseberry. He threw out a warning to Quebec that incipient outbreaks of this rust should at once be stamped out. Mr. J. C. Chapais read one of his delightful popular papers on Chrysopa or Golden Eyes. Father Leopold on behalf of Professor Letourneau read a most interesting and valuable paper on Pear or Twig Blight, a disease which is doing considerable damage in the orchards of this province. Mr. Cowan of the Botanical Division, Ottawa, read a paper on "Some Potato Problems," in which he discussed the various potato diseases. Father Fontanel of St. Mary's College, Montreal, read a very interesting paper entitled "The Active Army in the Fields and Instruction in Books", in which he made suggestions as to how the work of nature study might be fostered in the schools. He said it was very essential that the pupils should be acquainted with the common things in order that they might be able to understand them when they came to deal with them in practical work on the farms.

At the evening session the president, Professor Lochhead, read a paper entitled "Some Aspects of Insect Behaviour", and Dr. Matheson of Cornell gave a valuable illustrated address on "Apple Plant Lice and their Control." He discussed the three common species of plant lice and described the resemblances and differences in their life history and powers of reproduction. H. B. Roy of the Oka Agricultural Institute in a very interesting illustrated address described the effect of smelters on vegetation in the Sudbury district. It was very clear from the slides and his descriptions that the farmers of that district suffer very severe losses on account of the poisonous fumes given off from the smelters.

The attendance of regular members was between 40 and 50, the largest in the history of the Society.

PLANT PESTS

Do not set out raspberry plants affected with crown gall.

Cut out and burn all cankered currant canes.

Do not put fresh manure on corn land, especially if there was much smut in corn last year.

A dormant wash does little good in controlling scab. Hence, on account of the high price of spraying compounds, do not spray when unnecessary.

Many diseases of nursery stock are controlled by spraying. Begin spraying as soon as leaf buds unfold. Use lime-sulphur 1-40 or Bordeaux mixture 4-4-40.

Treat oats and barley with formaldehyde for smut.

Be sure to fan seed wheat very thoroughly to get rid of all light and shriveled kernels, which are probably scabby, and then treat all seed wheat with formaldehyde.

Spray currants and gooseberries as soon as leaf buds begin to unfold, with either Bordeaux mixture 4-4-40 or lime-sulphur 1-40, to prevent powdery mildew and leaf-spots.

Copper sulphate has advanced 15 or 16 cents per pound. Lime-sulphur has not advanced materially. Therefore, use lime-sulphur or some of the made-up (paste) Bordeaux instead of Bordeaux mixture, whenever possible. Potatoes can not be sprayed with lime-sulphur.

The aphids are persistent breeders. The trees or shrubs most affected are roses, snow-ball, currant, apple, plum, and elm. The eggs of the plant lice pass the winter on the bark or buds of these plants and hatch as the buds begin to swell. Spray with lime-sulphur (1-9) at this time. As soon as the leaves appear, spray with nicotin sulphate according to directions on the container.

If plum pocket was bad last year, the trees should be thoroughly pruned, then sprayed with copper sulphate, one pound to nine gallons of water, or with lime-sulphur, one gallon with nine gallons of water, before the buds open. This should be followed with 1-40 lime-sulphur or other spray as for brown rot. Methods of controlling plum pocket are not well worked out, so these methods can not be depended upon entirely.

Be sure to look over the apple trees carefully. Cut out and burn all cankers. Black rot has been increasing in the state and since a great deal of early infection may come from cankered limbs, cutting out and burning is necessary.

When raspberries are uncovered, be sure to cut out and burn all of the dead canes missed last fall. The gray bark disease and anthracnose, also snowy tree cricket and red-necked cane borer, are controlled in this way. Keep the young canes covered with a protective spray of resin-Bordeaux mixture. Try it on at least part of the patch. The benefit will not be apparent for a year.

Rose bushes showing insect galls should be cut out and burned and should be sprayed now for rose scale with lime-sulphur 1-9. Old leaves should be destroyed on account of black spot.

Univ. of Minnesota

DONATIONS OF MAPLE PRODUCTS TO RED CROSS HOSPITALS

The following letters from Mr. W. R. Miller, President of the Quebec Provincial Branch of the Canadian Red Cross Society and Mr. John H. Grimm of the Grimm Manufacturing Co., Montreal, speak for themselves. We trust the appeal may meet with an even more hearty response than last year.

Montreal, 17th March, 1916

J. H. Grimm, Esq.,
% Grimm Manufacturing Company,
58 Wellington Street,
Montreal.

Dear Mr. Grimm:—

It has been represented to me so strongly from those in authority in our various Canadian Hospitals abroad what a very great amount of pleasure was given to our men overseas by the successful campaign you inaugurated last spring to supply them with the much appreciated home products of maple sugar and maple syrup, that I appeal to you again on their behalf, that this year might see no falling off in the shipment of the much coveted dainty that recalls to them so many associations of home.

I feel sure that if our Canadian farmers only realize what a treat a slight sacrifice on the part of each individual would provide for our brave lads at the front, the response from them would not only in no way fall off from that of last year, but would be largely increased. Will you impress on the sugar producers the fact that Canada has three times the number of men overseas this year, and for this reason, I ask you to put forth your best efforts to obtain as large a quantity of maple sugar and syrup as you possibly can.

Tell the farmers that the Canadian Red Cross Society will undertake to forward all contributions received.

With very appreciative thanks for your untiring personal efforts in this matter.

I am,
Yours truly,
W. R. MILLER,
President Quebec Provincial Branch

Montreal, 21st March, 1916

Dear Sir:—

About this time last year, in response to an appeal to the Red Cross Society from Colonel Gorrell, officer in command of the Duchess of Connaught Hospital, Cliveden, England, for maple syrup and sugar for our wounded soldiers, maple sugar-makers were requested to co-operate in furnishing supplies to the gallant men who have suffered in fighting for liberty and for Empire.

In response to this request, ten thousand pounds of maple sugar, and a thousand gallons of maple syrup were donated and forwarded to Great Britain. From the officers in command of hospitals in England have come letters expressing the gratitude of the wounded men for the typical Canadian dainty. Colonel Gorrell writes on the 5th January as follows:

"During last spring we received a large consignment of maple sugar and maple syrup "donated by the Canadian maple-sugar makers.

"I cannot tell you how much the patients appreciate this gift. They love it and long for it. "We have not any in stock at present, and wish "we had it by the barrel, as it is one of the articles sent to us from Canada, and I assure you "we cannot receive too much."

I am sure that a moment's consideration of what a little of our country's most delicious and characteristically natural food product means to poor sick, suffering, homesick soldiers will give you the desire to contribute just one gallon of syrup or 10 lbs. of sugar to sweeten their fate a little. It comes from "home", you know, and brings the reminder that the home folks have not forgotten their brave and splendid men.

The request of the doctors commanding I pass on to you, and trust that your influence among friends and neighbors may induce them also to become donors. Free transportation has been arranged for. I will see that all the syrup and sugar you send in, goes directly to the hospitals, through the Red Cross Society. Write your name on the shipping tag and attach it to your can or parcel. Should you require a further supply of tags, write either the Red Cross Headquarters or directly to the signer of this letter. Deliver your parcel to your nearest Express Agent, who will give you a receipt for it, and we will look after it at this end.

Perhaps I should add that no better means than this could be devised for helping the Maple Industry and popularizing it abroad. We shall certainly be doing something nearly national in character, when we minister to the wants of our suffering soldiers, perhaps our own precious flesh and blood among them. You may be sure the poor chaps want Maple Syrup and Sugar while far away from Canada on hospital beds.

Yours truly,
JOHN H. GRIMM

THE FARM AND FARM CROPS

THE ALFALFA CROP

Preparing the land and sowing

IN a previous article it was pointed out that many failures with alfalfa in Quebec have been due to the soil being "sour" or "acid", and to poor limestone or lime, and by sowing only on well drained land much better results might be expected. Other failures may be attributed to the use of seed of tender strains. These might be obviated by using those that have proven hardy in this climate such as, Grimm, Baltic or Ontario Variagated.

A successful crop depends too upon having the soil properly and thoroughly prepared, few farm crops being as dependent upon this as alfalfa. This is due to the fact that for the first season it is not a strong grower and is not able successfully to compete with grass and weeds for possession of the ground. It does not attain its full development for at least two years after being sown and requires on that account special attention to its conditions of growth. Land in good condition to be sown to alfalfa should be, 1. free from grass and perennial weeds, 2. fairly fertile, 3. at least reasonably free from annual weeds and 4. in good physical condition. Until these conditions can be brought about it is unwise to sow alfalfa as results are sure to be disappointing.

These requirements are likely to be most nearly approached in land that was in corn or roots last year. Manure is usually applied for these crops and if the cultivation has been as thorough as it should have been, weeds will have been kept in subjection. Such land if it has been fall plowed in 1915 will only require to be kept cultivated and harrowed to conserve moisture and establish a good tilth. Special attention may have to be given patches of grass or weeds. If the land is still unplowed it may still be got into good condition by plowing as early as possible and by giving it thorough cultivation until sowing time with the object of firming the soil and freeing it of grass and weeds.

Land that produced a grain crop last year is likely to require more attention, in that it will probably not have been manured and will have more grass and weeds. However, as alfalfa does not require to be seeded early there is sufficient time to prepare such land. Manure is likely to be beneficial and should be applied and plowed under as soon as the condition of the land will permit. The subsequent cultivation will need to be particularly thorough to eradicate grass and perennial weeds. If this cannot be effected it would not be advisable to sow alfalfa this year as young alfalfa has no enemy more to be feared than grass, and of all the grasses couch is the most objectionable.

It is seldom wise to attempt to grow alfalfa on land that has been in hay for a number of years. It is almost impossible to insure a stand free from grass and it is therefore usually advisable to put in a hoed crop and follow this with alfalfa. In preparing any land it must constantly be borne in mind that grass is the arch enemy of alfalfa and while some grasses are worse than others, they are all bad and should be thoroughly cleaned out.

FERTILITY:

While fertility is of less importance than freedom from grass and weeds it must not be overlooked, as on poor land it is not only more difficult to get a good stand but the subsequent crops are smaller. It is not necessary to have the soil excessively rich, but it should be in a good state of fertility and well able to produce a good crop of corn or roots. Part of the feeding of the alfalfa crop may safely be left until it is well established, when it can be top dressed with manure; but the richer the soil is at the time of planting the better are the prospects for a strong growth the first year or two.

If the land has been properly cleared of grass and weeds it will, through the cultivation involved, be in good physical condition—fairly firm below with no open air spaces and an inch or two of fine soil on top. This condition is desirable for all kinds of seed, but is more important with crops such as alfalfa that have small seeds, than with the large seeded crops like oats or wheat.

NURSE CROPS:

In sowing alfalfa in eastern Canada it is a common practice to use a nurse crop of grain as is done with timothy and red clover. There are arguments both for and against the practice with the weight of evidence rather in favor of sowing

A good stand of alfalfa in rows. Three weeks after cutting.

without a nurse crop. The only advantages in using a nurse crop are that a crop of grain is secured from the newly seeded land and the grain crop in covering the land fairly quickly, checks the growth of annual weeds. This shading is, however, frequently detrimental to the alfalfa as it is a sun loving plant and if the nurse crop is heavy the young plants are often injured beyond recovery. In dry seasons too the grain crop absorbs most of the moisture and if the alfalfa is not actually killed it is usually greatly weakened and instead of being a foot high in the fall as it should be, it is so small as to be completely hidden by the stubble. Such a stand is often winter killed the first year.

Where the alfalfa is sown alone these dangers are avoided. It gets abundance of sunlight, there is usually plenty of moisture and available plant food and the only difficulty likely to be met with is the growth of annual weeds. Where the land has been properly prepared there is less danger of losing the stand on this account than through the use of a nurse crop, and the least risky course should be chosen. The loss of a light crop of barley on a few acres is of less consequence than the loss of a stand of alfalfa particularly when we consider the present high price of seed.

AMOUNT OF SEED:

When sown alone fifteen pounds of good seed evenly distributed will give a good stand, but if a nurse crop is used twenty pounds of seed should be sown, and not more than one bushel of barley per acre. When sown with barley the alfalfa seed is sown broadcast from the grass seeder attachment to the grain drill the same as clover and timothy seed and the land harrowed after sowing. By this method there is more or less loss of seed through some being covered too deeply and some left in the surface with no covering of soil.

Where no nurse crop is used a more economical method may be adopted. The seed is sown from the grass seeder attachment but instead of being broadcasted it is sown in rows by attaching the grain tubes to the short spouts of the grass seeder. In this way the seed is carried to the shoes of the drill and is evenly distributed at a uniform depth. Being small the seed must not be covered with more than an inch or an inch and a half of soil and care must therefore be taken to put little or no pressure on the drill.

SOWING IN ROWS:

Those growing alfalfa for the first time would do well to start on a small scale by sowing a piece in rows one and a half to two and a half feet apart. This method of sowing has several advantages, particularly to the beginner. A few square rods of land in the garden can be properly prepared at little expense by applying lime and manure, the seed used need not cost more than one dollar, as a pound will sow nearly a quarter of an acre in rows, and it can be kept perfectly free of grass and weeds by means of the cultivator and hoe. The yield of hay from alfalfa in rows will surprise any one who has not seen it grown in this way. The plants having more room branch profusely and in some seasons will produce as much hay as broadcast seeding. For seed growing the row system is superior to any other, as not only is more seed produced per acre, but it is of better quality and contains fewer weed seeds. The man who sows a small area in rows has, therefore, not only a chance to study alfalfa as a hay producing plant, but is also in a position to increase his acreage at reduced expense by producing his own seed.

INOCULATION:

As is well known alfalfa in common with other legumes is able to utilize in its growth the free nitrogen of the air by means of bacteria which live in association with the roots. Without these bacteria alfalfa will not thrive so that on land that has not previously produced the crop it is necessary to introduce them artificially. This may be done in either of two ways: by scattering soil from a well established alfalfa field at the rate of 100 to 200 lbs. per acre on the land where the seed is to be sown, or by inoculating the seed with a laboratory culture of the bacteria. This culture may be obtained free, with directions for its use, from the Division of Botany, Central Experimental Farm, Ottawa. When soil is used as the medium for introducing the bacteria care should be exercised not to introduce new weeds at the same time. The soil should be scattered over the land to be seeded and immediately harrowed in, as direct sunlight is fatal to the bacteria. Soil from a field of sweet clover will have the same effect as that from an alfalfa field.

TIME OF SEEDING:

As alfalfa revels in hot weather and when very young is rather sensitive to cold there need be no hurry in sowing it. During May and the first half of June the land should be thoroughly prepared by liming, manuring and cultivating and the seed sown about the middle of June. Seeding may, where annual weeds are very bad, be postponed until about the end of July, but there is danger in waiting too long as the plants may not be strong enough to withstand the winter.

JAMES MURRAY,
Macdonald College

LIGHTNING RODS

PROF. W. H. Day of the Ont. Ag. Coll. writes the following note regarding the installation of lightning rods:

Lightning rods properly installed are almost perfect protection against damage by lightning.

The proper way to rod a building roofed with metal shingles is as follows: Ground both eaves of the metal roof by fastening the cable to the metal of the eaves and carry the cable down the corner of the building and into the ground to permanent moisture. On an oblong building at least two ground connections are necessary, preferably at diagonally opposite corners. Four ground connections would be even better. If there are any eavetroughs or water-spouts these should be connected to the ground rods. The bottom end of every waterspout should be connected to ground rods or grounded separately. When the groundings have been properly attended to then there should be some points placed on the building along the peak, on cupolas and beside chimneys.

The agent's explanation of the negative and positive electricity neutralizing each other is all right. In this way many flashes are prevented. But in spite of the rods and points a flash sometimes occurs and to take care of these the agent's method of rodding is defective. If a flash were to strike the eaves, as it sometimes does in spite of rods on the peak, that flash would not travel up to the peak and get on his ground rod, consequently on metal roofs particularly, it is absolutely necessary, for full protection, that the ground rods should leave the roof at the eaves. There is no need of any cable except the ground rods on a metal roof. The roof itself will carry the current from the point to the ground rods.

For a sixty-foot barn without cupolas or ventilators, four points would be necessary.

A copper cable composed of strands of wire and weighing over three ounces per foot is a first class cable for lightning rod purposes, and if properly installed will give good protection.

SOIL TESTS FOR FARMERS

SOURNESS or acidity in soils, so prejudicial to maximum yields in most farm crops, has been found to be prevalent in many parts of Quebec. This unfavorable condition is easily remedied by the application of ground limestone, slaked lime, or wood ashes.

From a casual examination of soil it is impossible to detect the degree of sourness; this can be done only in a chemical laboratory.

So important is this question of soil sourness that the Chemical Department of Macdonald College has undertaken to make the necessary tests for farmers who are interested. Samples of about one quart representing the top 6" of soil may be sent by mail accompanied by the following data:

1. Name and address of sender.
2. Treatment in regard to manure and fertilizers for two years previous.
3. The prevalence or otherwise of sorrel.

No charge will be made for the work of examining and reporting on the samples.

TREAT SEED OATS FOR SMUT

LAST season was particularly favorable to oat smut in the eastern part of Canada, resulting in a great increase of loss from this source. The grain crop will also be worse infected than usual, hence farmers should treat their seed oats very carefully this spring. A small expenditure in time and money may, in this way, increase the yield per acre by five to fifteen bushels.

The prevention for smut in oats is as follows: On the evening before the seed oats are to be sown prepare a solution of formaldehyde (formalin), 1 pint to 40 gals. of water. Spread the oats five inches deep on the barn floor and sprinkle one gallon of the solution to each bushel. Shovel over thoroughly and cover the pile completely with the oat sacks, blankets, etc. The following morning spread the pile out to dry. Much of the moisture will have been absorbed by the grain, hence the seeder should be regulated to allow for the swelling of the seed.

Seed Branch, Ottawa

HOME-MADE LIGHTNING RODS

1. Practical Experience

LAST summer we had a nice little visit from a lightning rod agent who seemed worried over the unprotected condition of our barn. He was so anxious that our property should be rendered safe from the fury of the tempest that he offered to rod the building, (which is 42 x 100 feet) with a fancy copper cable and ornamental points for something like the sum of fifty dollars. Imagine his look of horror and pity when we told him bluntly that we intended to rod the building ourselves, using ordinary galvanized barb-wire. He had to acknowledge that fence wire was a fairly good conductor of electricity, but he argued that as the galvanizing coat was injured the efficiency of the wire as a conductor was greatly lessened. Competent authorities have told me, however, that as long as the body of metal is not lessened at any point the efficiency of the rod is not impaired.

The first problem which we had to solve was to twist three barbed wires into a cable. We arranged it in the following manner: Selecting a smooth place in the pasture where the grass was short, we strung out three lengths of wire as long as the cable was to be. One end of each of these strands was fastened to a fence post, the three ends being eight or ten feet apart, so that they would not become entangled. The other ends of the strands were made fast to the spokes of one of the wheels of our milk wagon; the opposite wheel being chained to a tree. When all was ready I turned the wheel while the man who was helping me managed the three strands of wire at the point where they were being twisted together. This was rather a difficult and somewhat dangerous position to fill, as I could judge by the anxious expression upon his face and an occasional exclamation of a sulphurous nature. He soon found that the twisting wire was tearing up pieces of sod and weaving it into the cable. Fortunately for us there was a rail pile near by, so we soon had a few rails under the wires, which overcame this difficulty. As the wires tightened with twisting we had to release them from the fence posts and hitch them in other places to prevent breaking. Even then we had a few breaks, but these were easily repaired. When the cable was finished we hitched one end to the hind axle of the wagon and "snaked" it up to the barn. This cable weighed, when finished, three ounces to the foot.

For groundings we used some pieces of half-inch round iron which we happened to have on hand. Near the west end of the barn there is a never-failing well. By running one of the round irons to the bottom of this well we had a first-class "grounding" to start with. The cable was attached to the iron well above the ground, care being taken to give plenty of contact between rod and cable. The cable was then run up the north-west corner of the barn to the eaves, then from the eaves to the peak, using ordinary fence staples to keep it in place. Running along the peak to the middle of the barn it was given a loop around the cupola, with a branch running to the top of the cupola. When the east end of the barn was reached, the cable was allowed to follow the roof down to the eaves on the south-east corner, then down the post to the ground. The barn stands on "made" ground, in a place which was at one time a frog pond, so we can strike water at any time by going down four or five feet. This, of course, made our groundings easy, for we were able to strike permanent moisture (after digging down two or three feet with a shovel) with an ordinary crowbar. In order to give plenty of ground connection for the size of the buildings we ran a second cable over the middle of the barn, grounding it at the north and south sides.

We are told by scientific men who are in a better position to understand these things than you and I, that when a building is rodded all metal work about it should be connected with the cable. Bearing this in mind we ran wires from the iron horse-fork track and from a galvanized iron water tank which we have in the barn, and attached them to the cable at the nearest points.

Someone may ask why we used barb wire in making the cable instead of plain galvanized wire, which would have been much easier to handle. The reason is that we wanted the barbs to serve the purpose of the lightning rod man's points. Barbs are not so ornamental as copper points, but they are certainly cheaper, and, according to these same scientific men, will serve the same purpose when there are many hundreds of them, as in the case of our barb wire cable.

C. S. MOORE,

Standridge East

2. Theoretical Approbation

MR. Moore asked my advice before installing the lightning rod described above and I told him that I considered the barbed wire lightning rod, if properly installed, equal to the most expensive lightning rods sold.

In any system of lightning rods there are four chief points to consider: First, good grounding; second, points; third, the conductivity of the metal; fourth, durability.

To understand the action of lightning rods we must understand the cause of lightning. To understand this we must know that there are two kinds of electricity, one called positive electricity and the other called negative electricity. These two kinds have a very strong attraction for one another. A cloud containing lightning is charged with either one kind or the other and it attracts the opposite kind to the surface of the earth just beneath it. For example, if the cloud is highly charged with positive electricity then it attracts an equal charge of negative electricity to the surface of the ground just beneath it. This negative electricity comes from the very large store of both kinds on the earth. As the cloud moves over the earth with its positive charge, the negative charge follows it along the ground. These two kinds are trying to unite and if the negative charge can run up on a building, or up a tree, it is that much nearer to the positive charge in the cloud and the two kinds may unite. If they do unite there is a flash of lightning. This is the cause of flashes of lightning.

Now, the duty of a lightning rod is to conduct the electricity from the ground up to the top of the building and discharge it gradually into the cloud. This discharge takes place from the points. Moist ground is a good conductor of electricity and the electricity moving along the ground moves through moisture mostly. Thus it is necessary to have good grounding in order to get the lightning rod down to where it will take up this electricity. When the electricity arrives at the rod it runs up to the top and the points discharge it into the cloud. The barbed wire lightning rod is superior to the most expensive lightning rods in the matter of points because it has hundreds of points where the lightning rod has only a few. Each point of the expensive rod, if it is sharp, is superior to a single barb, but the hundreds of points on the barbed wire are much superior to the few points. The electricity from the ground then moves up and is discharged from these points into the cloud. This not only removes the electricity from the ground, but destroy that in the cloud. The electricity is conducted from the ground gradually and therefore there is no suden rush of electricity, that is, there is no lightning flash.

Of the four points mentioned above, the grounding as described by Mr. Moore is equal to the best. The points on the barbed wire are superior to those on the best lightning rods. The conductivity of the barbed wire strands is sufficient to carry the electricity to the top and that is all that is required. Copper is superior to iron as a conductor, but the barbed wire has sufficient conductivity, as stated above. On the fourth point, durability, it is probable that copper will last longer than barbed wire, but the barbed wire will last a life time and as it only costs about 1-10 as much, a man can afford to replace it two or three times and still save money.

C. J. LYNDE

Macdonald College

LIVE STOCK

PRIZES FOR FLEECES OF WOOL

Shearing Competition Being Held at Ormstown Spring Show—June 7-8-9

TWO new features of the prize list of the Ormstown Spring Show are the prizes offered for wool and the prizes offered the winners in the shearing competitions. The production of good wool and the preparation of wool for market are two factors of vital importance to sheep men to-day. Present prices for wool have been a great inducement to closer study, and the keen rivalry of the show-ring will not only be a splendid object lesson to those who compete but also to those in attendance. In the art of shearing Quebec farmers often lack experience and there is much to learn in order that sheep be shorn neatly, quickly and kindly. Those who have an opportunity of seeing the best shearers in Quebec compete for first place in the shearing competition will be able to take home a mental picture of expert workmanship in the shearing of sheep.

PRIZES OFFERED

The following prizes are being offered for fleeces of wool:—

Class	*1st.*	*2nd.*	*3rd.*	*4th.*
Fine medium	$7.00	$5.00	$3.00	$1.50
Medium	7.00	5.00	3.00	1.50
Coarse	7.00	5.00	3.00	1.50

Fleeces of Southern and the finest of Shropshire, Hampshire and Suffolk may be entered in the fine medium class. Coarser and crossbred or grade fleeces of above and Oxford, Dorsethorn and Cheviot may be entered in the medium class. Leicesters, Lincolns and Cotswolds will be shown in the coarse class.

Fleeces will be judged on preparation, rolling, tying, cleaness, shrinkage, uniformity, density, length and strength of fibre, brightness, crimp and softness.

Paint, twine and taglocks will be considered a disqualification.

Shearing Competition

A prize of $10.00 is offered for the winner in the shearing competition and $5.00 for second place. A special prize of $5.00 is offered for the man who makes the neatest and best work in shearing.

HOWICK-HUNTINGDON AYRSHIRE BREEDERS' CLUB

ABOUT 50 breeders of Ayrshire cattle living in the Counties of Beauharnois, Chateauguay and Huntingdon, in the Province of Quebec, met at Ormstown on the 22nd March and organized a Breeders' Club for the district. W. F. Stephen, Secretary of the Canadian Ayrshire Breeders' Association, took charge of the organization of the Club which was perfected, named as above, and a Constitution and By-Laws adopted.

There are over 100 breeders of Ayrshires in this district and it is expected that it will become a strong and progressive Club.

The following officers were elected : — *Hon. President*, Robt. Ness, Howick; *Hon. Vice-President*, James Cottingham, Ormstown; *Hon. Secretary*, W. F. Stephen, Huntingdon; *President*, James Bryson, Brysonville; *Vice-President*, R. R. Ness, Howick; *Secretary-Treasurer*, Gilbert McMillan, Huntingdon, R. R. No. 2; *Auditor*, P. D. McArthur, Howick; *Directors*, D. A. Macfarlane, Kelso; W. C. Tully, Athelstan; J. P. Cavers, Ormstown; Hector Gordon, Howick; R. M. Howden, St. Louis.

DUNDAS-GRENVILLE AYRSHIRE CLUB

QUITE a number of the breeders of Ayrshire cattle residing in the above two counties met at South Mountain, Ont. on March 24th, and organized an Ayrshire Club, to which they gave the above name.

The meeting was arranged by Mr. E. P. Bradt, District Representative of the county of Dundas. W. F. Stephen of Huntingdon, Que., Secretary of the Canadian Ayrshire Breeders' Association, was present and spoke of the advantages and possibilities of the Club work and brought the organization to a successful issue with nearly 20 members. There are many more to come in, as there are a number of Ayrshire herds in the counties and many new herds have been recently, and are now being started. The Ayrshire breed is particularly adapted to the conditions of Eastern Ontario.

The following officers were elected:—

Hon. Pres.—James Ballantyne, Chesterville, Ont.
President—Wesley Hamilton, Chesterville,
Vice-President—Elgin Montgomery, South Mountain,
Sec.-Treas.—Arthur Christie, Winchester,
Auditor—Herb. Walter, Winchester.
Directors: — Geo. Gillespie, Ventnor; A. J. Cumming, Kemptville; S. D. Thorpe, South Mountain; Conrad Whittaker, Williamsburg; Wm. Walker, Winchester.

In the evening Mr. Stephen gave an illustrated address on "Ideals in Dairying" to a large audience.

CANADIAN AYRSHIRE BREEDERS' ASSOCIATION

THE last report sent to the press, of Ayrshire cows that qualified in the Record of Performance, contained the names of 47 cows and heifers,—12 in the mature, 5 in the four-year old, 8 in the three-year old, and 22 in the two-year old class.

Among them were some exceptionally good records. "Betsy Brown"—30888—owned by A. S. Turner & Sons, Ryckman's Corners, Ont. heads the list with 15178 lbs. milk and 646 lbs. fat, in 337 days, and with an average test of 4.25%.

"Eileen"—18220—, owned by G. D. Mode, Vankleek Hill, Ont. gave 13835 lbs. milk and 610 lbs. fat in 365 days. Her average test was 4.41%. This cow finished her test in 1915 and would have won a Silver Cup had her owner made a formal entry. "Eileen" has a cumulative 4 year record of 52520 lbs. milk and 2378 lbs. fat.

A Saskatchewan cow, "Polly of Hillview 2nd"—32089—, owned by C. E. Thomas, Lloydminster, Sask. made 12061 lbs. milk and 494 lbs. fat. All but three in the mature class gave over 10000 lbs. of milk and nearly, or over, 400 lbs. fat.

In the four-year old class, "Snowflake of Glenwood"—43649—,owned by O. F. Medwin & Son, Greensville, Ont., leads. She gave 12561 lbs. milk and 533 lbs. fat. This heifer also finished her test in 1915 and would have won a Silver Cup had her owner forwarded her year's report ere the year closed.

In the three-year old class, "Redhill's Gay Lass"—35775 — owned by R. R. Ness, Howick, leads with a most creditable record of 10983-lbs. milk and 488 lbs. fat, and an average test of 4.44 in 333 days. She is closely followed by "Rosebud's Pearl"—34188—, owned by Joseph Thompson, Sardis, B.C., with 10220 lbs. milk and 481 lbs. fat, with an average test of 4.70.

In the two-year old class, "Primrose of Tanglewyld 3rd"—41737—made the highest score with 10750 lbs. milk and 481 lbs. fat, with 4.47% milk. This indicates that the "Tanglewylds" are sustaining their reputation as producers. There is great uniformity in the class both in the production of milk and fat.

The highest average test of any one individual was 5.02, six tested over 4.50, thirty tested from 4. to 4.50, and the balance all but one tested from 3.76 to 4 per cent fat.

This indicates that Ayrshires produce a high testing milk and when paid for by the butter fat content, realizes a big price per cwt.

W. F. STEPHEN,
Sec.-Treas.

Huntingdon, Que.,
April 14th, 1916.

OFFICERS OF LOCAL WOOL GROWERS' AND SHEEP BREEDERS' ASSOCIATIONS FOR 1916

PONTIAC.—

President—Howard Walsh,
Vice-President—J. R. McDowell,
Secretary-Treasurer—J. K. King,
Directors — Wm. O. Reilley, Noble Hamilton, Alex. Erwin, Hugh Ross, Wm. Beattie, E. J. Barber, Stewart Stark, Ellard Hodgins, Wm. Palmer, Wm. Grant, Wm. Stender, E. C. Dahms, Wm. McCleary, Thomas Quaile, Matise Kluke, Jas. Carswell, Martin Griffin, Dom. Sloan, David Gamble, Chas. Belec, John Stitt, Felix Milette, John Watt, Stephen Robinson, Patrick Ryan, P. Desjardins, M. J. Darcey, T. St. Aubin.

Further directors to be appointed at Calumet Island and Chichester.

ARGENTEUIL.—

President—J. R. Clelland,
Vice-President—Wm. Hay,
Secretary-Treasurer—L. J. Westbrook,
Asst. Secretary-Treasurer—W. Gall,
Directors — E. Morrin, Mr. Blair, J. Watson, Henry Hammond, Erskine McOuat, P. McGibbon, J. Healthy, G. Staniforth, Geo. Fraser, John Hay, A. Doig, Wm. Hume, D. Morrin, J. E. Arnold, R. Dobbie, H. Laughren, H. Grey, J. Boyd, R. Copeland, T. Gain, H. McDonald, J. Arnott, A. McWillock, Geo. Robinson, A. Copeland, R. McCullock, Edgar Boyd, T. Morrison, Amos Kerr.

SHERBROOKE COUNTY.—

President—A. F. Ward,
Vice-President—J. A. Woodward,
Secretary-Treasurer—W. G. MacDougall,
Directors—Guy Carr, Mr. Berwick, Mr. Burton, D. Saunders, E. D. Hammond, I. J. Parnell, Wm. Young, John Hyatt, Mr. Tasse, F. R. Mitchell, W. S. Armitage.

STANSTEAD COUNTY.—

President—G. L. Temple,
Vice-President—Geo. Page,
Secretary-Treasurer—A. F. Emberley, E. E. Temple,
Directors — H. G. Curtis, H. E. Baldwin, B. Frappier, B. J. Oliver, J. Voisard, T. J. Little, B. Bessette, H. Bordreau, W. Ketcham, W. H. Bowen, E. R. Camber.

COMPTON COUNTY.—

President—Geo. Hodge,
Vice-President—T. G. Bennett,
Secretary-Treasurer—J. H. King, H. A. Taylor.
Directors—Chas. Lefebvre, Henry Sherman, D. J. Saunders, M. H. McLeod, Murdo J. McAuley, R. J. Mills, Ed. Waldron, M.M. Beaton, A. L. Hall, Murdo D. McKenzie, Sam Gobeil.

DISTRICT OF BEAUHARNOIS.—

President—David Pringle,
Vice-President—John Roy,
Secretary-Treasurer — H. R. Graham, R. E. Husk,
Directors—Chester Waddell, Albert Armstrong, Chas. Ellerton, John Roy, Jas. Bryson, Robt. Kerr, John Goodall, Robert Hunter, Aimé LaFramboise, Wm. Beattie, F. L. Brown, Mr. Rennie, John Leighty, H. R. Graham.

DISTRICT OF BEDFORD.—

Directors—R. E. Miller, T. H. Miller, Horace Green, Wm. Strong, David Binning, Fred Arthur, Austin Chamberlin, Arthur Lefebvre, David Taylor, Mr. McElvey, Geo. Beach, Wm. Miltimore, Harry Strange, Wm. Pendleberry, John Gibson, W. W. Mason, Mr. Pasinault.

..*President*, *Vice-President* and executive committee to be elected by directors at first meeting.

RICHMOND COUNTY.—

President—R. G. Dunbar,
Vice-President—Geo. Barlow,
Secretary-Treasurer—C. H. Hodge,
Directors — Wm. McCrae, Gordon Bogie, Alf. Davidson, John Kendall, John Horan, W. A. Morin, Sam St. Pierre, Jacob Hutchison, Ernest Wilkins, R. W. Frank, Geo. Morrill, D. Dustin, E. Searle.

A few of the animals belonging to the Jersey herd of Mr. O. A. Baldwin, Coaticook, P.Q.

A LITTLE EXPERIMENT IN THE FEEDING OF PIGS

PROFESSOR Henry, in his book on "Feeds and Feeding", tells us that a pig weighing from 50-100 lbs. requires 4 lbs. of grain, or its equivalent, to produce one pound of gain. A pig weighing from 100-150 pounds requires 4.37 lbs. of grain to produce one pound of gain; and one weighing 150-200 lbs. requires 4.82 of grain for the one pound increase in live weight. These figures are the compiled results of over 300 feeding trials from over 30 Experimental Stations, so may be taken as fairly accurate for average conditions.

Last winter we carried on a small "home-made" experiment which proved to our satisfaction the value of a little skim milk when fed to young pigs in combination with grain. We started this experiment with the idea of verifying, if possible, Prof. Henry's figures under our own conditions. The amount of skim milk mixed with the feed was so small that we did not take the trouble to weigh it, and I am very sorry for this omission, for I am aware that the results obtained can only be of comparative value; but at the time we had no idea of publishing the results. However, during the period of 78 days of feeding only 4746 lbs. of milk went to the creamery, and (deducting 10% for cream) 4272 lbs. of skim milk were brought home. Part of this was fed to the hens and part to some pigs not in the experiment, so it is certain that our four pigs on trial did not receive a very liberal allowance.

These pigs were put in a pen by themselves on November 18th, weighing at the time 205 lbs. or an average of 51¼ lbs. each. During the 78 days of the experiment they were fed the following amounts of grain in the order given:—

	Lbs.
Provender (ground oats, peas and barley) and bran..	155
Wheat middlings..	276
Ground barley and shorts..	431
Ground barley and corn meal..	477
Total grain..	1339

The use of such a variety of feeds was not premeditated. We used whatever grains we had on hand at the time; the general plan being to supply plenty of bone—and muscle—forming material such as we find in oats, peas, beans, shorts and middlings, until the pigs were fairly well grown, and then to finish off with more fattening foods such as corn and barley. The grain was wet with water and what skim milk there was, and allowed to soak for several hours before feeding. The mash was made thick, as we do not like to force pigs to swallow a lot of cold water in cold weather. Whenever I see pigs fed a watery slop I think of the hound in the fable who tried to drink a lake dry in order to get at a bone which he saw at the bottom.

On the 4th February the pigs were sold, the lot weighing 755 lbs., having gained 550 lbs. in the 78 days, an average of 1.75 lbs. per day for each pig. Dividing the total amount of grain fed (1339 lbs.) by the gain in weight of the pigs (550 lbs.) we find that 2.43 lbs. of grain were required to make one pound of pork. Comparing these figures with those quoted from Prof. Henry it is very evident that the small amount of skim milk which was fed was responsible for a large part of the gain in weight; in other words, something over 1000 lbs. of grain was saved by the skim milk, if Prof. Henry's figures are taken as a basis for comparison. It seems to me that when skim milk is fed in this way it has a feeding value over and above what its analysis would show. It certainly adds to the palatability of the ration and I am inclined to think that its presence adds to the digestibility of the other foods with which it is given.

C. S. MOORE,
Stanbridge East

RULES AND REGULATIONS FOR "BACON HOG" CONTEST

1.—This Competition is open to any boy under eighteen years of age at time of entry.

2.—Applications for entry in this Competition must be made on the regular form provided by the Quebec Department of Agriculture, and forwarded to the Department of Agriculture before May 31st. 1916. Forms may be had by applying to the Department of Agriculture.

3.—Each contestant must feed and exhibit two hogs. Three hogs may be fed, however, and from these a selection of two made before time of exhibition.

4.—Hogs must be weaned at the age of six weeks, and competition will date from time of weaning.

5.—Each contestant must personally select, feed, and care for his entry. No restriction will be made with regard to breed, feed, or feeding.

6.—An accurate account must be kept of all feeds, in kind and amount, from time of weaning until time of exhibition. Forms will be provided for this purpose and failure to comply with this regulation will disqualify the contestant.

7.—Within two months after weaning hogs will be inspected and marked by a representative of the Department of Agriculture, and the Department will reserve the right to inspect and investigate any entry at any time. In case of dispute decision of the Department representative will be final.

8.—The judging will be done by men appointed by the Department. The awards will be made on the following basis:—

a. The suitability of the hogs for the export bacon trade in regard to type, condition, finish, and general appearance as set out in score card.

b. General character of contestant's work throughout the competition.

10.—Notice and time of exhibition will be given during the month of August.

Prizes will be awarded as follows:—

In case of 1 to 3 exhibits, one prize........first, $6.00.
In case of 4 or 5 exhibits, two prizes......first, $6.00; second, $5.00.
In case of 6 or 7 exhibits, three prizes....first, $6.00; second, $5.00; third, $4.00.
In case of 8 or 9 exhibits, four prizes....first, $6.00; second. $5.00; third, $4.00; fourth, $3.00.
In case of 10 or 11 exhibits, five prizes...first, $6.00; second, $5.00; third, $4.00; fourth, $3.00; fifth, $2.00.
In case of 12 or more exhibits, six prizes...first, $6.00; second, $5.00; third, $4.00; fourth, $3.00; fifth, $2.00; sixth, $1.00.

In no cases will prizes be awarded where pigs do not score at least 50 points.

The Competition will take place in the following Counties and will be held at the following towns or cities:—

Counties	*Municipalities*
Bagot	Acton-Vale.
Drummond	St. Germain-de-Grantham
Dorchester	Ste. Rose
Bellechasse	St. Charles
Champlain	St. Stanislas
Portneuf	St. Casimir
Rouville	Rougemont
Iberville	St. Jean
Quebec	Quebec (Exhibition Gr.)
Montmorency	St. Joachim
Richmond	Richmond
Shefford and Brome...	Waterloo
Labelle	Mont Laurier
Kamouraska	Ste. Anne
Arthabaska	Victoriaville
Two-Mountains	St. Eustache
Beauharnois and Chateauguay	Howick
Beauce	Beauceville
Lac St-Jean	Hebertville Station
Chicoutimi	Chicoutimi
L'Islet	St-Jean-Port-Joli
Megantic	Plessisville
Montcalm and L'Assomption..	St. Jacques-l'Achigan
Rimouski	Rimouski
Yamaska	St. Guillaume.

SCORE CARD

1. TYPE .. ..50 points

Side—Length and straightness with reasonable depth.

Back—Straight, with uniform width.

Hams—Full but not bulging, tapering toward hock joint.

Shoulders—Light, smooth, compact.

Head—Strong but indicating quality, free from coarseness and flabbiness.

Neck—Medium length, not too thick and not arched on top.

Strength—Good proportion throughout with plenty of depth and thickness to insure good feeding quality.

Quality—Bone should be strong but not too coarse. Joints clean and well defined. Hair, fine. Skin smooth and free from wrinkles. No flabbiness at jowls or flanks.

2. WEIGHT.

175-225 lbs. live weight.. .. ..20 points

3. CONDITION & FINISH.

Well covered with firm flesh, especially along back and loin, but not heavily loaded with fat.. .. .. ..20 points

4. GENERAL APPEARANCE.

Style and breeding, and attractiveness of exhibit.. .. ..10 points

Total.. .. ..100 points

THE REARING OF THE CALF AND HEIFER

By Neil Sangster, Ormstown

(A Contribution to the Symposium "Building Up the Dairy Herd", held by the Huntingdon Dairymen's Association at its Annual Meeting)

THE profitableness of dairying depends to a large degree upon the rearing of the heifer calves from the best cows in the herd, and sired by a pure bred bull of quality. Improvement of the herd can best be made by replacing the discards with well-bred home-reared heifers of greater productive capacity.

Build up your Herd from Within

Starting with common cows one may in a few years build up a high-producing herd. On the other hand the dairyman who replenishes his herd by purchase must pay high prices for animals which, though of good appearance, may be well bred. Careful dairymen are loath to part with their best heifers, preferring to keep them in their own herds.

Another important reason for rearing your own calves is that it is much easier to keep the herd free from such diseases as tuberculosis and contagious abortion when the heifers are home-raised than when they are being brought from outside sources.

Though the value of the calf at birth depends on its breeding, the feed and care it receives while young are fully as important factors in deciding its future usefulness in the herd. The raising of calves will ever remain an art in which much depends on the skill and judgment of the feeder, who should study the individual requirement of the animal rather than follow blindly any hard and fast rules.

How to Raise Calves on Skim Milk

The fat of the milk being very valuable, few dairy calves are raised on whole milk where skim milk is available. Those prejudiced against rearing calves on skim-milk by the sight of unthrifty, undersized skim-milk-fed specimens should know that such results are not due to the removal of fat from the milk on which they were fed, but to the ignorance or carelessness of the feeder. Careful dairymen have clearly shown that skim-milk calves, properly fed, develop into as good cows as those fed whole milk.

The skim-milk calf is usually allowed to get its milk from the dam two or three days, though I believe it is better never to allow the calf to draw milk from its mother. I claim that if separated from its mother, it learns more readily to drink from the pail.

In any event the calf should get the first milk, which is designed by nature for cleansing the bowels and starting the digestive functions. The calf is best taught to drink milk from the pail by using the fingers. If it is allowed to go until genuinely hungry, much less difficulty will be experienced in the first lesson. The young calf has a small stomach and naturally takes milk frequently and in small quantities. Too large an allowance of milk is apt to cause indigestion and scours.

I would advocate feeding three times a day at first, which occasions little extra work when the cow is milked thrice daily. When the cow is milked twice a day the bother of warming the milk at noon is held by many not to be repaid. In all cases the milk should be fed as fresh as possible and at blood heat. The allowance of milk should be gradually increased, but overfeeding, the common cause of poor success in calf rearing, should be avoided at all times. A safe rule is always to keep the calf a little hungry.

When the calf is two to four weeks old, skim milk may gradually replace the whole milk, a week or ten days being required to get the calf on skim milk alone.

Supplementing the Skim Milk Ration

After the change to skim milk, the allowance should be gradually increased and a handful of oilcake fed twice a day in the milk, until the calf learns to eat it dry. The addition of bran or oilcake to the farm grains may be helpful in teaching the calf to eat. The dull calf may be taught to eat by rubbing a little on its muzzle when it is through drinking.

Having learned the taste of the meal the calf should be fed its allowance dry, from a convenient feed box, until it becomes accustomed to the new article of diet. A supply of meal should be kept before it. After this it should be fed only what it will eat up clean.

Calves will begin to eat hay at the same time as they do grain. A small amount of silage from well matured corn may be fed to calves when eight or ten weeks old. When roots are available they are a most satisfactory succulent feed. The aim should be not to fatten the calf but to keep it in good growing condition.

Scours and How to Treat Them

The most frequent trouble in raising calves by hand is indigestion or common scours. This is usually caused by overfeeding and by the use of cold milk, by dirty pails or feed boxes or by keeping the calves in dark, dirty, poorly ventilated stalls. Each animal should be watched closely for signs of scours, for a severe case gives a set back from which it recovers but slowly.

At the first indication of scours the ration should be reduced to less than half the usual amount. Common scours should be distinguished from contagious, or white scours, which is due to an infection of the navel soon after birth. This most serious disease from which an animal once infected rarely recovers, may usually be avoided by providing that the calf be dropped in a clean stall or pasture. When the calf is born in the barn it is best to wet the navel thoroughly with a disinfectant of creolin or zenoleum.

Treatment of the Heifer

The rearing of the heifer after it is six or eight months old is an easy task; and perhaps because of this, many are stunted for lack of suitable feed. Since the usefulness of the cow when mature is dependent on her proper development, before the first calf is dropped—it is important to heed the few essentials in feeding and caring for the heifer.

Heifers on good pasture require no additional feed. In winter there is no better feed than silage, clover hay, oat straw and a little grain to keep them thrifty without becoming fat. The age at which heifers should drop their first calf depends on the breed, size and development of the individual. Some breeders believe that if the heifer calves at an early age the tendency to milk production will be intensified.

Where early calving is practised, breeders should allow 18 or 20 months to elapse between the first and second calving in order to give the heifer an opportunity to continue its growth. Further it is believed that lengthening the first lactation period tends to make the heifer a more persistent milker.

The Cow in Milk

The cow giving a large flow of milk is working as hard as the horse ever does, therefore the grain given her should be ground or crushed and roots should be sliced or pulped. As the cow takes kindly to dry feed and everything entering the paunch is quickly soaked and softened, there is no occasion for feeding slops. The common practice of feeding cows twice daily, morning and evening, with a little roughage at noon, is a reasonable one. Habit is strong with the cow and a simple system of feeding, and stable management once established should be rigorously enforced.

To skilful feeding and wholesome quarters the successful dairyman adds regularity and kindness. While milking is usually regarded as a simple task which anyone can do, there may be a great difference in the returns which different milkers get from the same cow. A cow should be milked quietly with damp hands (a little vaseline is very good) and stripped out thoroughly, the milker bearing in mind that the last drawn carres about ten times as much fat as that drawn first.

CHRONIC BLOATING OF BULL

Editor, Journal of Agriculture,

Question—

OUR bull has been suffering for some time from chronic bloating. He is fed carefully on ensilage, roots and hay with only a small amount of grain. This bloating takes place about once every two weeks and with the last attack he was in danger of suffocation and had to be tapped. What could be done to prevent this bloating?

W. R., Missisquoi

Ans.—Cattle, especially these that have been kept in the stable for some time, are liable to suffer from chronic bloating. In this form the animal generally bloats up after feeding but seldom swells sufficiently to cause any alarm. This is also a symptom of tuberculosis, in those cases in which the glands lying between the lungs are so enlarged as to press upon and partly obstruct the esophagus.

If the bloating is due to indigestion look carefully to the feed; reduce the quantity and see that it is of good quality; a change would be of great advantage. The animal should also be forced to take exercise as this has a strong tendency to stimulate the activity of the digestive apparatus. A purgative of 2 lbs. epsom salts and 1 table spoonful of ginger as a drench will empty the intestinal tract. This should be followed with a tonic of equal parts of baking soda, powdered gentian and wood charcoal, mixed and given one table spoonful in feed twice a day. If tuberculosis is suspected as the cause, I would strongly recommend having the animal tested by the tuberculin test.

N. E. McEWEN

JOINT-ILL OF COLTS

Editor, Journal of Agriculture,

Question—

LAST season I lost two colts from joint-ill. The same mares are in foal this year. Can anything be done to prevent the foals getting the disease?—S. W. P., Brome Co.

Answer — Joint-ill in foals is due to a bacterial infection and is very closely related to infectious abortion in the mare. Infection is generally introduced by the navel or while the fetus is still in the uterus. In no other way can cases that appear at or shortly after birth be accounted for. I do not think anything practical can be done to prevent those cases due to intrauterine infection, but navel infection can be prevented to a great extent by local treatment of the navel cord, which should begin as soon as possible after the foal is dropped. The cord should not be tied, unless there is strong evidence of bleeding, as blood imprisoned behind a tied cord forms a splendid breeding ground for germs.

The cord should be cut about six inches from the abdomen and with the foal in a standing position the stump of the cord should be soaked in some form of disinfectant as tincture of iodine, or cresylone, then dried with a dusting powder. This powder should be applied night and morning till the cord is well dried, which should be in about a week or ten days.

The stall in which the mare is to foal should be thoroughly cleaned and chloride of lime used freely on the floor.

Cleanliness and the use of disinfectants will prevent a great number of cases due to navel infection.

After a foal has shown symptom of joint-ill, the only treatment that is anything like satisfactory is a vaccine, and when this is used the mortality is greatly reduced provided the treatment has been started in time, 70 to 80% of the cases making good recovery. Such results are encouraging and indicate that vaccine treatment is superior to any other treatment known at present.

Preventive inoculation is strongly recommended when the disease is prevalent in the district and by this means the disease can be prevented.

N. E. McEWEN, B.V., Sc.

ABORTION IN COWS

Editor, Journal of Agriculture,

Question—

WE have had several of our cows abort within the last few weeks. What is the cause of abortion? What can be done to prevent it? How much time should elapse after abortion before it would be safe to breed the animal?—A. P., Chateauguay.

Answer — Abortion in cattle is generally due to infection. It is not in itself a disease but merely one of numerous symptoms. It is due to inflammation of the uterus by infection with the abortion bacillus. This same inflammation of the uterus may prevent conception, or pregnancy may continue for the normal period, and inflammation of the uterus, recognized later by discharges from the vagina, which are frequently associated with retention of the afterbirth. These symptoms would ordinarily indicate infection with contagious abortion. This disease is wide-spread, and so far as is known an animal once infected is always infected though at times the virulence of the infection may decrease until hardly recognizable. The carbolic acid or methylene blue treatments are of no avail. Abortion vaccines have given some fairly satisfactory results.

It is imprudent to sell cows because they have aborted as they are just as safe to breed, after proper handling, as any other cows.

The cow that has aborted should be bred when her genital organs have been brought back to health. This may be a month or it may be never, and the time elapsing after the abortion has nothing to do with the breeding of the animal.

If a cow aborts during the first five months of pregnancy the membranes usually come away with the fetus, and there is no afterbirth or discharge from the vagina

If left to herself the cow may be in good condition to breed in 50 to 60 days, but if the uterus is carefully disinfected four or five times the animal may be in condition for breeding in 30 days. If a cow has suffered from retained afterbirth and has been neglected, or even given the best possible attention she may never again be fit to breed.

Precaution against abortion should commence before the animal has been bred, as the infection must be in the uterus at time of conception, for after the animal has proved with calf no treatment will be very satisfactory.

Endeavor to keep the animals as sanitary as possible. Before breeding a heifer or cow it is advisable to douche the vagina with 1 ounce of Lugol's solution to three gallons of water three times per week for 21 days, or one heat period, and then breed. Continue the douching for another three weeks, and if the animal appears to be safely in calf the douching may cease.

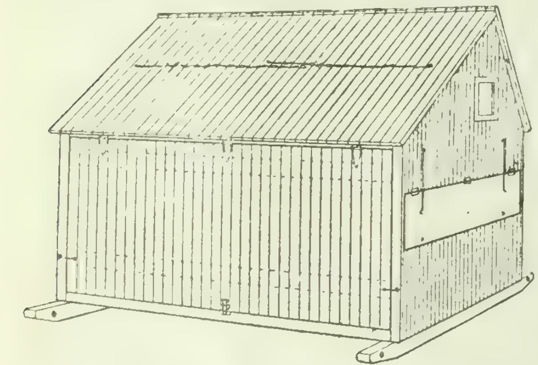
N. E. McEWEN

PORTABLE HOG HOUSE

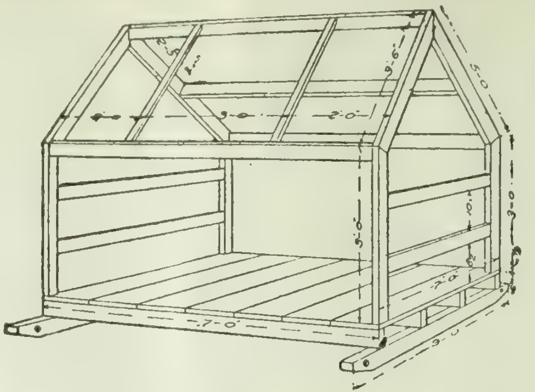
Good Type of Building Used at a U. S. Government Farm—Details of Construction

THERE are numerous forms of individual hog houses constructed to be portable and adapted to accommodate a sow with pigs, or two or three hogs. Almost every portable house that is built possesses certain features peculiar to itself and rendered necessary by the circumstances which it is intended to meet. The type of hog house described here has been successfully used on the Government Experimental Farm at Beltsville, Md.

This house presents a very attractive appearance and has proved satisfactory in general service. It is simple in construction and possesses all the essentials of an ideal hog house. It can be moved from place to place whenever desired. The perpendicular walls furnish plenty of floor space, which can be used to good advantage. The doors, ventilators, and roof are so arranged as to provide for ample fresh air and shade. The wires fastened to the roof (Fig. 2) and lying on it serve to hold up the back for ventilation and to shade the ground. The back is swung open and the hooks that held it shut are hooked in these pieces of wire. In the winter the house can be closed to shut out the cold winds and the roof opened to give fresh air and sunlight to the interior.



Back View of Portable Hog House, showing the Ventilator and Back Closed.



Perspective of Portable Hog House, showing Framing Details

In moving the house a good way is to take a chain or a strong rope and fasten it to the runners through the holes bored for the purpose, fasten to a clevis, hitch on a team, and take the house wherever desired.

CONSTRUCTION DETAILS

The runners are the foundation of the house and should be of sufficient dimension (3 by 6 inches) to hold the house well off the ground. Wood which is short-lived and decays when placed in contact with the ground can not be recommended. The more durable woods are fir and cypress. Two joists are used to stiffen the floor, so 1-inch material is of sufficient thickness to make a good floor. The frame is built of 2 by 4 inch material.

The house is covered with ⅞ by 2 inch tongued-and-grooved pine boards, which is very tight and sheds water. Ten-inch shiplap could be used satisfactorily and will reduce the cost of building the house. A satisfactory fender is made by fastening 2 by 4 inch pieces flatwise 6 inches from the floor. Fenders are absolutely necessary for the protection of the young pigs.

Paint will aid in prolonging the life of the house as well as improving the appearance. Any good paint which will stand the weather will be satisfactory, but two coats should be given to thoroughly cover the wood. The inside of the house can be given a good coating of whitewash. This will give it a clean and sanitary appearance.

BILL OF MATERIAL

The following material is necessary for the construction of the portable house:

	Board feet.
7 pieces 2 by 4 inches, 16 feet long, for the entire framework	75
1 piece 3 by 6 inches, 18 feet long, for the two runners	27
4 pieces 1 inch by 1 foot by 16 feet long, for the floor and two ventilators	64
1 piece 1 by 6 inches by 18 feet, for braces on doors and ventilators	9
50 pieces ⅞ by 2 inches, 16 feet long, tongued and grooved, for the entire covering of the house	133
Total	308

2 4-inch barrel bolts, one for the door and one for the back ventilator.
4 button latches for the two end ventilators.
6 pairs of 12-inch strap hinges for the roof, doors, and ventilators.
6 5-inch hooks and eyes, No. 6 wire, to hold up ventilators when open.
2 pieces of No. 9 hog fence 1 by 7 feet, for two end ventilators.
2 pieces of burlap, 1 foot square, for windows.
15 feet No. 11 wire, to hold up ventilators when open.
Nails: 20-penny nails for the framework, 8-penny common-head nails for the lighter lumber; 8-penny coated nails preferred for the tongued-and-grooved boards.

Weekly News Letter,
U. S. Dept. Agric.

THE CAUSE OF BARRENNESS IN DAIRY CATTLE

GREAT pecuniary loss is sometimes suffered by farmers owing to the barrenness of their cattle. The causes of barrenness are numerous. Too much food will cause an animal to become excessively fat, this interferes with the process of reproduction in many ways. Another cause of barrenness, and one which is equally harmful, is the keeping of an animal in too poor a condition. In the latter case the animal can only just manage to sustain herself, getting enough food perhaps for her own body, but by no means sufficient to warrant her carrying on the all important process of reproduction.

Barrenness, especially in high bred stock, is often caused by too close breeding, i. e., breeding from animals too closely related to one another. Although close breeding is the best method to adopt in the formation of new breeds, if carried too far it will eventually result in a ruined constitution and weakened frame. Line breeding, or, in other words, breeding from animals from one common stock, but not closely related, is the safest and most advisable method to adopt.

As regards foods, sugar and sugary foods have a detrimental effect upon the reproductive organs of an animal, and therefore all such foods as syrup should never be fed in very large quantities.

The best foods to promote constitutional vigour are those containing plenty of phosphates, and a reasonable amount, but not an excess, of proteins.

Some animals are constitutionally barren. Nothing can be done to remedy this. Sometimes there may be some small defect curable by a simple operation. As artificial insemination can be successfully practised, no valuable animal should be declared incurable until a veterinary surgeon has been called in.

Old age is the cause of barrenness in older animals and such animals should be replaced by more desirable stock.

Another cause of barrenness may be due to the action of a micro-organism living along the urino-genital tract, which by causing the canal to become acid, destroys the vitality of the male sperm. Any animal suffering from this form of sterility will show upon parting the lips of the vulva, a slight rash. This eruption is due to the presence of the micro-organism which causes the sterility. This form of barrenness is likely to be found when a herd is just recovering from the effects of contagious abortion.

The best cure in this case is the injection of a solution of potassium bicarbonate, one ounce dissolved in one pint of lukewarm water, and injected about one hour before service. This complaint is contagious, and can be transferred from one animal to another by the bull. The sheath of the bull as well as the vulva of the cow should be injected with a solution of boracic acid or a wealk solution of carbolic acid from time to time.

In some instances barrenness is the fault of the bull. Some bulls have great difficult to procreate a calf at all. Others will breed on one animal and not on another. In this case it may be considered desirable by the breeder to send the cow to another bull and to discard the old one.

B. C. T.

THE DAIRY

MACHINE MILKING A NECESSITY

FOR the last 5 years the milking machine has been making slow but steady progress, but the cheap help always available in the province of Quebec has prevented it from being used more generally. However the war has put a different aspect on the situation. Help is hard to get and besides our farmers should do all in their power to get the same or better returns with less help than formerly and here a milking machine will give valuable assistance.

The milking machine is decidedly more economical that hand milking. The other day I visited a farm where for a yearly expenditure of $155.—including charges for capital outlay, depreciation and running expenses—an actual saving was observed of 1800 hours in milking time. Such a saving is of course tremendous.

Further, a large herd hand-milked demands much help and it is not always easy to find employment for so many hands during the rest of the day. By using a milking machine a large herd can be kept with very little help on a small acreage.

A further point to be considered is the purity of the machine drawn milk and we are sorry to state that as a rule hand drawn milk is purer. However, this is entirely due to the inadequate directions given by the milking machine manufacturers, who advise for example keeping the rubber parts in lime water when not in use.

The other day we examined some samples of lime water, machine-drawn milk and hand-drawn milk and the results were as follows:

Lime water—50,000 bact. per c.c.
Machine milk—40,000 bact. per c.c.
Hand milk—35,000 bact. per c.c.
Water used in the barn—10 bact. per c.c.

We see here how the unfortunate use of lime water increased the bacterial content of the milk tremendously. It is much better to use instead of lime water a 1% solution of chloride of lime, and to renew this solution every other day. Chloride of lime can be bought commercially in 25 lbs. boxes and is then very cheap.

Then we have the difficult question whether machine milking will interfere with the milk flow or injure the animals. The usual way of milking is to extract the last drop of milk by means of the machines and strip only by way of a check. This custom of having the full power of the machine acting on an empty udder is liable to injure the cow and reduce the milk flow: A much better method is to remove the bulk of the milk as fast as possible, then disconnect the teat cups and finish by hand. This way of fast milking tends to increase the milk flow and the cows do not get restless as when the machine pulls away at an empty teat. Finally the absorbing question remains regarding the best make of machine. Every farmer seems to have his own preference and it seems to us that there is little to choose between the more expensive and larger machines. An intelligent farmer will get good results with all of them. In regard to the lower priced machines we must advise caution, as a reduction in price is often accompanied by a reduction in size and by inferior material. The prospective buyer should investigate whether spare parts can be bought in his locality and adjusted easily, cheaply and without expert help.

J. VANDERLECK

THE TESTING OF DAIRY PRODUCTS

THE price of success is attention to detail. This fact is distinctly emphasized in a bulletin recently issued by the Dairy and Cold Storage Branch of the Federal Department of Agriculture under the title of "The Testing of Milk, Cream and Dairy By-Products by Means of the Babcock Test" and written by J. F. Singleton, Chief Inspector of Dairy Products. Without being profuse Mr. Singleton tells in plain language about all that is to be told of the practical application of the test, the care that should be taken of the component parts of the apparatus, the measurements advisable and the methods that should be employed. The qualities naturally most emphasized are exactness, cleanliness and temperature. The Dairy Commissioner in his introduction says there is nothing fundamentally new in the bulletin but that the contents are presented with such a clearness of diction and the processes so aptly set forth that the result is a reliable handbook for those who value information on the testing of milk, cream and so on. A number of exact and plain illustrations lend additional worth to a notable bulletin, the number of which is 45 of the Dairy and Cold Storage Series, and that can be had by post-free application to the Publications Branch, Department of Agriculture, Ottawa.

AN OBJECTIVE POINT

THE question has often been asked, somewhat facetiously perhaps, "Do you keep cows, or do they keep you?" To many dairymen this has started a strain of thought resulting in vastly improved prospects.

To come right down to business, why do you keep cows? Surely it is in order that they may contribute handsomely towards income. If you are already satisfied on that point, well and good; but, one excellent result of cow testing is the solid fact that it helps men to increase their income considerably; that is one main objective point reached. The same story is repeated in all provinces in the Dominion, it runs something like this: from a man at Barnston, Que., "My cows average almost two thousand pounds of milk more than two years ago", or again from a man at Petersburg, Ont., "I have increased fourteen hundred pounds of milk per cow, and hope to go up another fifteen hundred", or this, from a man at Hagersville, Ont., "My herd is pretty near double in three years by weeding out", and once more, from St. Boniface, Que., "My seven cows brought in $145 more this year, my records showed me it paid to care for them better."

The Dairy Division, Ottawa, will gladly send milk record forms if you write for them. Be sure that each cow pays.

C. F. W.

INTELLIGENT SELECTION

NOT only interest but real value attaches to the question of carefully noting the individual performance of each cow in the herd. It is only after keeping a complete record that one finds such a strange contrast as this: of two five year old cows in one herd, both fresh the same day, both dried off the same week, one gave 5,454 pounds of milk and 213 pounds of fat, the other gave only 3,570 pounds of milk and 153 pounds of fat. Most probably the owner would not have taken on a bet at the beginning of the season that the one cow could bring in over twenty-two dollars more than the other, but she did.

In another section, of two cows the same age, one gave 8,430 pounds of milk and 362 pounds of fat, but the other gave only 1,690 pounds of milk and 67 pounds of fat. Is there a difference of eighty-eight dollars in the earning power of any two cows in your herd?

Building up a profitable dairy herd includes the selection of good individual cows. The rational method is to weigh the milk and test samples regularly for fat. Write to the Dairy Division, Ottawa, for information on cow testing, so that your selection may be intelligent, so that your profits may be larger.

C. F. W.

TURN WASTE TO PROFIT

RECENTLY a proprietor of a large, modern business in a thriving city was heard to remark "my twelve months' trade shows, after allowing myself a low weekly income, not one cent of profit, on all the capital, risk and worry." He distinguishes closely between income and profit for the year.

Does the average dairyman consider his farm business in the same light, each department of its many activities, grain, poultry, lumber, pork, hay, milk? Further does he distinguish between income and profit when dealing with the herd? If (and much depends on that "if") each cow makes a good profit he is indeed well off. Even if each cow is responsible for a good income, things are not

Students in the School of Agriculture, Macdonald College, learning to make the Babcock test.

too bad. If some of your cows waste good feed because they are not possessed of ability to make milk economically, find it out; turn waste to profit. Make the cows keep you, that is their job; you need profit on the feed, profit to pay for your investment of capital, risk and worry, the same as any merchant. A letter to the Dairy Commissioner, Ottawa, will bring you free of charge milk record forms, either daily or three days per month, feed records, and a herd record book. When you note down total production and closely estimate cost of feed by occasional weighings, you arrive at individual profit. Make each cow pay a good profit.

C. F. W.

POULTRY

POULTRY QUERIES

A Beginner in Poultry

Editor, Journal of Agriculture.

I have decided to start a poultry farm, and would like to have your advice on a few subjects if it will not take up too much of your time. I have made fairly well out of my hens this winter, and feel sure that if I had enough hens to keep me employed all day that I could do better. I have 100 Rock hens and they paid their keep since the first of December and make me about $10.00 per month extra with very little care, for I have been too busy to give them all the care they should have got. I have a Tolman house and have had no sickness in the flock. I would like your advice whether to build more of the same type of house or if you think the Macdonald type better; I have had no experience with one but I like the Tolman well. Which type of house do you like best, or would you advise some of both for different purposes? Or perhaps you would think it better to have one large house like the one you have at the College. I intend to keep about 300 over next winter and gradually build up a large flock. Please give me what advice you can on this matter.

E. H., Lennoxville

ANSWER:—

So far as the housing proposition is concerned I think it would be well to stick to the Tolman house since you are fairly well satisfied with it. I believe it is just as good as the Macdonald type and I do not think you would find any advantage in changing. I think if you are going to keep about 300 hens next winter three of the Tolman houses should work all right, although we have really found 80 birds do better in a house 20 by 20 than 100. We found our flocks of 100 birds in our Tolman house here just a little crowded, so we reduced it to 80 this past winter. As to whether you should build a long house or a number of Tolman houses, much depends upon your local conditions. If you are able to raise the chicks on free range, giving them clean soil at all times, I believe a long house would really be more economical, keeping your birds in flocks of about 50.

M. A. J.

EGGS NOT STRICTLY FRESH

Editor, Journal of Agriculture.

I have a small flock of poultry, say 30 to 40, and of late I had two or three complaints in regard to the *strictly fresh eggs* being not fresh or something like an egg that had been several days under a sitting hen and had the appearance of producing a chick later. I have been told it is from over feeding or too much meat. If not too much trouble please advise.

S. A., Farnham, P.Q.

ANSWER:—

At this season of the year one is liable to have trouble with blood spots or partially incubated eggs. Sometimes strictly fresh eggs will have blood spots in them which to some people may seem like a developing chick. This is very different to overcome and the only way to remedy it is to candle the eggs and select out the blood spots. To make sure that you do not sell partially hatched chicks it is necessary to gather the eggs once or twice a day and see that no broody hens are allowed to remain upon the nests for any length of time. Heavy feeding of meat seems to be conducive to the formation of blood-spots. In other cases certain hens seem predisposed to lay eggs with blood spots; this may result from an abnormal condition in the oviduct.

M. A. J.

THE BEST BREEDS

Editor, Journal of Agriculture.

Will you please give me the following information about poultry. Which are the best hens for sitting? I have Barred Rock and rose comb Rhode Island Reds. I find them good layers but am bothered to get them to sit early in the spring. I would like to get some that would sit early and be a good market fowl if there are any. What are the Buff Orpingtons like?

E.H.P., Shawville, P.Q.

ANSWER:—

The Barred Plymouth Rock and the Rhode Island Red are two of our best sitters, and they should become broody about as early as any other breed. They also make a fine market fowl, in fact they are two of the best breeds we have. The Buff Orpington is also a good breed but I do not think it would be any improvement over your present breeds.

M. A. J.

DISPOSING OF OLD HENS

Editor, Journal of Agriculture.

I have about 50 or 60 old hens to get rid of. When is the best time; how, live or dead; and can you give me the names of anybody who will handle them? I believe in June the Jews have big holidays. Would it pay to send them in them, and when are the holidays?

T. A., Laurel, Que.

ANSWER:—

From now until the forepart of June is the best time to dispose of your old birds. The Jewish population in Montreal calls for live poultry and the market pays good prices from Easter until June. I think the sooner you can market them now the more money you will make and I would prefer shipping them alive. I would suggest the Harris Abattoir Co., Henry Gatehouse, and Gunn Langlois, of Montreal, for quotations.

M. A. J.

SHADE AND GREEN FOOD FOR CHICKS

The most profitable chicks are those which keep up a good rate of growth right from the start. In order to do this they must be kept under the best of conditions; they must be given proper treatment in the brooders or while with hens they must be well fed on good food, they must be given plenty of range and a good shelter, and finally they must be kept free from lice and mites.

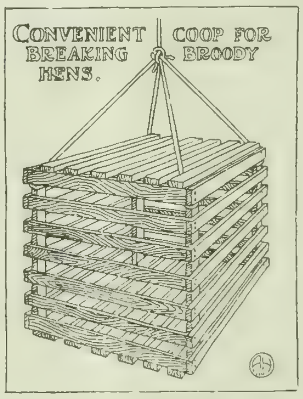
The problems of brooding and feeding have been touched upon in previous issues of the journal, so that here I merely wish to emphasize two important features which have much to do with proper growth. An abundance of shade is necessary, particularly during warm weather, to give the chicks comfort. Where chicks are on free range there are usually plenty of shade trees or other places where they can go while not in search of food. The importance of providing adequate shade becomes more obvious where chicks are raised in confinement or on limited ground. Under such conditions it is imperative that shade of some sort be provided. This can be done by stretching a piece of canvas or heavy cloth on a frame and nailing the frame to four pegs driven in the ground, the frame being about two or three feet above ground.

The same general remarks may be applied to the feeding of green food. When the chicks have their liberty they usually get plenty of green food, on the average farm at least. On the other hand, where they are raised in confinement they should be given a liberal supply of green food every day. Give them sprouted oats, green alfalfa or green grass.

M. A. J.

BREAKING UP BROODY HENS

During the hatching and brooding season there are usually more broody hens than are required and the extra ones should be so treated as to start laying again as soon as possible. Also, after the hatching season is over all broody hens should be taken from the nests and placed in slatted crates where the air can circulate from the bottom of the crate upwards. Broody hens should be well treated; the primitive method of ducking them in cold water or making them stand in a few inches of water for a few days does a great deal of harm.



Convenient coop for breaking broody hens.

A good hook for catching fowls.

The broody coop should be made of slats on all sides, the bottom slats being about one-half inch apart and the slats on the top, sides and ends being about one inch apart. Hang the coop from the ceiling leaving it suspended about three feet above the ground. Attach a feed trough and a watering can to the coop. Feed the birds well, giving two whole grain feeds per day and also a feeding of moist mash made up of bran, cornmeal, crushed oats and middlings. Give them plenty of clean water every day. Under proper treatment they should be in good laying condition in a short time.

M. A. J.

POULTRY DEPARTMENT EXTENSION WORK

Some Lines of Work Being Carried on by the Poultry Department of Macdonald College in an Effort to Improve Poultry Conditions in Quebec

By M. A. Jull

THE Poultry Department of Macdonald College endeavors to keep in as close touch with the farmer as possible, not only in its work at the College but more particularly with reference to its work throughout the province. The College is carrying its work to the farmer in an effort to solve its problems on his own farm. Nothing appeals to the farmer as much as a practical demonstration and with this in view the College has arranged several lines of demonstration work to be carried on throughout the English speaking section of the province in conjunction with the Poultry Department. Aside from the actual demonstration work the Poultry Department carries on an educational campaign which supplements the practical work.

SHORT COURSES

In conjunction with other Departments of the College the Poultry Department provides short courses at various places in the province. These short courses are held usually in January and February of each year, Lectures and demonstrations are given relating to the more important problems of the average farmer. A short course of three weeks' duration is given at the College in February and March and is intended to assist in supplying the demand for practical knowledge combined with a lecture course on the more important aspect of poultry culture. From time to time throughout the year institute meetings are addressed and demonstrations are given at farmers' meetings.

EDUCATIONAL EXHIBITS

In regard to extension work this department arranges educational exhibits for the larger poultry and agricultural shows held in the English speaking sections of the province. These educational exhibits deal particularly with the commercial side of the poultry industry. These exhibits are comprised of models of poultry laying houses, brooder houses, trap-nests, fattening crates and batteries, dressed poultry cooling racks, egg cases, shipping boxes, incubators, brooders, and many other models of apparatus used in the raising of poultry. Charts showing the ideal types of the more important breeds of poultry, reading charts which emphasize the leading features of the poultry industry, and other material is used to encourage the interest in poultry keeping. Blue prints, giving plans and specifications of poultry houses, are distributed free as well as our bulletin on "Farm Poultry".

DEMONSTRATION POULTRY HOUSES

In order to determine the most satisfactory types of houses for laying fowls for the province of Quebec the Poultry Department of Macdonald College has had erected six demonstration houses in different parts of the province. In Pontiac county the house is located at Yarm on the farm of Mr. Bert Hodgins, the house in Huntingdon is located at Athelstan on the farm of Mr. E. C. Boyce, in Rouville county at Rougemont on the farm of Mr. Edgar B. Standish, in Missisquoi county at Dunham on the farm of Mr. G. M. Beach, in Sherbrooke county at Capelton on the farm of W. G. Loomis, and in Compton county at Cookshire on the farm of Mr. E. N. Chaddock.

These houses will serve the purpose of experimentation and demonstration, the primary object being the improvement throughout the province of farm poultry housing. The houses have been located on carefully selected farms with the purpose of making the demonstration of as local a nature as possible. Three different types of houses have been erected and the conditions of management are made as comparable as possible.

Careful records are being kept for at least three years concerning the management of the poultry plant and expenses and receipts. The houses are open for inspection at any time and farmers are invited to examine the house in their district. Each farmer who has a demonstration house is always glad to assist the farmers of the community in their poultry housing problems. When the records are completed at the end of three years it is hoped that the available information obtained from this demonstration scheme will be of much value in improving the poultry industry through better housing of the laying stock.

RURAL SCHOOL WORK

The Poultry Department has realized that one of the best methods of improving agricultural conditions in the country is through the medium of the rural school. If the school children of to-day can be given an interest in some phase of agricultural work then much will be accomplished toward an improved agriculture. Aside from the question as to whether agriculture should be taught in agricultural schools and academies the Poultry Department believes that a definite line of practical work can be taken up by the rural schools which will mean much to improve the poultry industry. Doubtless there are many ways in which rural schools can become interested in agricultural work, but the method employed by the Poultry Department of Macdonald College was to distribute hatching eggs to the school children and to conduct a rural school fair. In the spring of 1913 one hundred settings of hatching eggs were distributed free to school children in three counties of Quebec. In 1914 there were 425 settings distributed in nine counties of the province, while in 1915 six hundred and ten settings have been distributed in eleven counties of the province. The eggs were supplied free of cost to the most deserving pupils and were selected by the College Demonstrator located in the county with the cooperation of the principals of the academies and the teachers of the rural schools. The conditions upon which the eggs were supplied free were simple. Each applicant agreed to do the best possible with the chicks hatched and to show them at a specified rural fair. At the fairs substantial prizes are given and up to the present this line of work has been a decided success.

While one of the fundamental objects of this extension work on the part of the College is the improvement of the poultry industry of the province, it also secures practical results in greater interest in poultry raising, improvement in breeding in the various districts and the establishment of community breeding centres. Aside from the economic returns, the feature is distinctly educational, since it brings the pupils in direct contact with the underlying principles in the production of a staple agricultural product. Practical poultry work and poultry instruction are well adapted to student life and to the general course of study.

COMMUNITY BREEDING CENTRES

In conjunction with the rural school work and to further encourage the poultry raising in the various districts the Poultry Department has outlined a scheme for the production within the province of hatching eggs required for the school work. The object of this scheme is to encourage the poultry industry locally and if possible to adopt community breeding centres. The scheme consists in selecting certain farmers in each district who will agree to certain conditions in the management of the flocks and will agree to furnish the College with the number of hatching eggs the College may require at a stated price. The only condition required by the College on the part of the farmer is that he shall secure his breeding cockerels from the College from year to year and that his female flock may be of satisfactory breeding as judged by the inspector, who will be an extension man of the College. His place must be open for inspection at any time and the College will endeavor to assist the farmer in every possible way. This scheme will not only be of direct benefit to the farmer whose flock is selected, but it will be of a decided benefit to the community. Doubtless as the work progresses several farms in each community will be selected where one breed only will be kept and every effort will be made to establish community breeding centres.

In conjunction with this line of work the College is also preparing to take surveys of poultry conditions in the various counties of the province. Through this line of work the College hopes to be able to learn of actual conditions in the country in order that it may be prepared to get at the bottom of things and assist the farmers in the most practical and efficient manner.

THE VAMPIRES OF THE POULTRY HOUSE

Protect Your Birds from Mites Which Can do Them To Death

ON the well regulated poultry farm lice and mites are more troublesome than all the other poultry diseases and parasites combined, with possibly an exception in the case of some of the contagious diseases which sometimes do serious damage. Fowls which are infested with lice or mites to a serious extent are never profitable. There are about twenty different species of lice and mites which infest poultry, but only a few of these are of practical importance to the poultry raiser.

THE CHICKEN MITE

This parasite is discussed quite fully in Bulletin 69 of the Iowa Experiment Station from which the following extracts are taken: Dr. Repp says that his observations have shown that chickens which are infested with mites are exceedingly unprofitable. The cost of keeping them is increased, and the income from them is very much reduced. Indeed when badly infested, they are totally incapaciated for performing work. The hens will cease laying, the ovaries undergo atrophy and on autopsy will be found shrunken, and in a condition unsuitable for work. In several flocks on which I have made observations I have found that egg production was greatly reduced or altogether prevented during the spring and the summer when, under normal conditions, it should have been at its height. Hatching hens will often die on their nests as a result of the mite invasion or will leave their eggs, literally driven away by the vast hordes of mites which accumulate upon them. In case of three hens which thus died upon the nest in one flock of sixteen hens, I could find no tissue change on post mortem examination which would account for death. There was, however, an impoverished condition of the blood which would be produced by the sucking of the blood by the mites.

If the hen survives the ordeal to which she is subjected while hatching, the young chicks as soon as they leave the protection of the shell are attacked by the mites in great swarms, and, as a rule the majority of them will succumb. I have known the loss of newborn chicks from this cause to reach 90 percent.

Chickens, both young and old, become reduced in flesh, and lose the energy for hunting and scratching which is so necessary to their welfare. The feathers will become roughened and drop out. The head will become pale and the chicken in every way will present an unhealthy and unthrifty appearance. Broilers which are being prepared for market will not thrive well and in the end will be unprofitable, in fact, a loss to the owner. In addition to the sucking of blood the mites further reduce the vitality of the fowls by biting them and disturbing their rest at night. The fowls require more food, and at the same time are incapable of converting it into tissue and energy as should be done in a healthy bird.

The mite has an average length of one-twenty fifth of an inch, and its width is about four-fifths of its length. It has eight legs by means of which it can move very rapidly from place to place. In color, it is light gray with small dark spots showing through the skin. About one in fifty or one hundred shows a distinctly red color, varying from a light to a dark red. This red color is due to engorgement with blood.

The mites are of peculiar and stealthy habits of life rather unlike what one would expect from a parasite. Indeed, they are only semiparastic, and as a rule remain upon the fowls only long enough to secure a meal. They are very active in their movements, and seem to be ever on the outlook for a victim. On account of their vigorous and vicious habits they may be styled the wolves of the insect parasites of poultry. The mites hide in crevices and under objects in the hen house, during the daytime while the chickens are outside, and lie in wait for their return. They lay their eggs, and the young are hatched in these hiding places. A barrel affords an excellent hiding and breeding place as the mites lodge between the staves under the hoops. In the nests, they are to be found under the straw and other nesting material. It is a noteworthy fact that a place which shows only a few mites on the surface may contain vast numbers in crevices or under objects. Often, they become so plentiful that they overflow the hiding places and appear in hordes upon the exposed surfaces. I have observed them so thickly settled as to cover the upper edge of an inch board and down the sides for a distance of two inches throughout four feet of its length, and at the same time, in almost as great numbers in neighboring places. On one occasion when the upper border of the next box was covered with mites as above described, a hen went upon the nest to lay. Within ten minutes, I noticed that at least three-fourths of the mites had left their position on the box. On lifting off the hen I found her to be swarming with mites.—*H. Atwood.*

PROFITABLE BREEDS FOR FARMERS

THE farmer desires a fowl which will not only be suited to his purpose but will also pay well. The breed which a farmer should keep will depend upon market requirements and the ruling price for eggs and poultry. Average prices for dressed poultry and eggs in the Province are good, and it will usually be found that those breeds which are good flesh producers, in addition to being good layers, are the most profitable. But there are vast differences among birds of the same breed; that is, there are good and poor birds in the one breed. One should aim to get a good strain of the breed chosen, as the breeding value of any strain is a very important factor.

PLYMOUTH ROCK. — There are six varieties of this breed, the most important of which are the Barred, White and Buff. The Barred Plymouth Rock is the oldest and most popular of the six varieties. All varieties are noted for their qualities as general purpose fowls, being excellent flesh-producers and good layers. They have single combs, yellow legs and flesh, are hardy, and lay brown or tinted eggs.

The standard weights are: cock, 9½ lbs; cockerel, 8 lbs; hen, 7½ lbs, and pullet, 6 lbs.

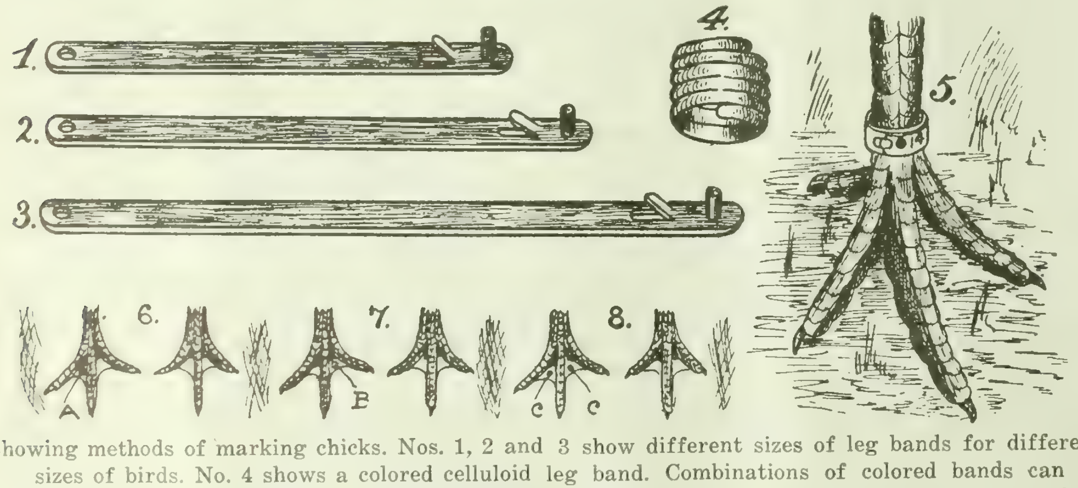
WYANDOTTE. — There are several varieties of this breed, including the Silver, Golden, White, Buff, Black, Partridge, Silver Pencilled, and Columbian. The last variety is one of the newest, while the White is the most popular. The Wyandottes bear the same commercial characteristics as the Plymouth Rocks. They have rose combs and are of a different shape, being deeper and shorter in the body. They are sometimes used as broilers.

The standard weights are: cock, 8½ lbs; cockerel, 7½ lbs; hen, 6½, and pullet, 5½ lbs.

RHODE ISLAND RED. — The two varieties of this breed are the Single and Rose Comb, and they have no material difference except in combs. The Rhode Island Red is popular as a utility fowl. As with all American breeds, the Reds have yellow flesh and legs, and lay brown or tinted eggs.

The standard weights are: cock, 8½ lbs; cockerel, 7½ lbs; hen, 6½ lbs, and pullet, 5 lbs.

M. A. JULL



Showing methods of marking chicks. Nos. 1, 2 and 3 show different sizes of leg bands for different sizes of birds. No. 4 shows a colored celluloid leg band. Combinations of colored bands can be used in poultry breeding work. Also these bands can be used to distinguish fowls of various ages. No. 5 shows a numbered leg band on the leg of a fowl. These bands are used in breeding work. Nos. 6, 7 and 8 show three pairs of chicks' feet, illustrating the various ways in which the webs of the feet are punched. Pair No. 6 is punched in the outer right web at A. Pair No. 7 is punched in the inner right web at B. and pair No. 8 is punched in the outer and inner right webs at C. Poultry can also be marked very effectively by inserting a band in the wing. This method is permanent and is one of the most effective methods employed.

PRESERVATION OF EGGS

Saturated Lime Water the Best Preservative

EXPERIMENTS in the preservation of eggs have been carried on by the Division of Chemistry, Dominion Experimental Farms, during the past fifteen years in order to obtain information as to the best preservative for use in the home. In this long period a large number of fluids and preparations advertised as egg preservatives have been under trial. These, for the most part, have proved utter failures, and looking back over the results it has not been possible to find one of these numerous nostrums that can be unhesitatingly recommended.

Of the media so far tested the two best, unquestionably, are lime water and a solution of water-glass (sodium silicate), and these two have been tested side by side, year after year, with the same result—that lime water has shown itself the more effective preservative. Not infrequently eggs have been kept in this medium, quite sound and fit for cooking purposes, more than a year. Eggs preserved in this medium for six to nine months have repeatedly been poached and eaten, and though no claim is made that they have been equal in flavour to new laid eggs they have presented a good appearance with no unpleasantness of flavour or odour. The three essentials to success are absolute freshness of the eggs when placed in the lime water, protection of the surface of the lime water from the atmosphere (or occasional removal of the lime-water) and the keeping of the vessel containing the eggs at a moderately low temperature.

During the past month a further experiment in this connection has been brought to a close, a comparative study being made of eggs placed respectively in lime water and a solution of water glass last June. These eggs, therefore, were eight months old and during their period of preservation the hottest of the year had been experienced. The eggs were submitted to the independent examination of five persons, who were asked to report critically as to appearance, flavour, odour, etc. These reports were almost identical and may be summarized as follows:—

In external appearance the eggs were equally bright and clean; there was nothing abnormal to be observed in this respect in either lot. The "yolks" of the lime water eggs were somewhat more globular and with stronger integument than those of the water glass eggs. Similarly the "whites" of the lime water eggs were less discolored and less limpid than those kept in the water glass solution. In nearly every instance it may be said, the appearance of the contents—both yolk and white—was decidedly superior in the lime water eggs. Several of the eggs on being "broken" were found to have a slightly stale odour. This was not in any sense markedly offensive, but was sufficient to indicate that the eggs were not fresh or new laid. This odour was the more pronounced, being somewhat soapy in character, in the case of the eggs from the water glass. All the eggs examined were poached and eaten; they were found to be sound and free from any marked taint; indeed, though not possessing the flavour of the new laid egg they were usable on the breakfast table. Three of the five persons testing the eggs reported that the lime-water eggs were decidedly superior when cooked, both as to flavour and appearance.—*Agricultural Gazette, March,* 1914.

WOMAN'S WORLD

FOODS AND FOOD PREPARATION

Lesson XXV

Frozen Dishes

THE frozen dishes have both a food and a dietetic value and are among the most grateful and acceptable of the summer desserts. If a good freezer is used, and the proper proportion of ice and salt used, the process of making these dishes is not at all difficult.

Frozen dishes may be divided into the following classes:—

1. Plain Ice Cream — Cream sweetened and flavored.
2. Custard Ice Cream—a thin custard sauce used with cream.
3. Mousse or Parfait—thick cream, whipped stiffly, sweetened and flavored, but not made in a freezer.
4. Sherbets,—fruit juice sweetened and diluted with water, egg white or gelatin being added to ensure a smooth texture.

Preparation

1. Select a *well-made* freezer and one that may be easily cleaned and sterilized.
2. Pour boiling water into freezer can and let stand some time, as wood in dasher becomes warped when not in use. Pour off boiling water. Add cold water to cool, then pour this off.
3. Prepare mixture to be frozen and let it get cold.
4. Place freezer can in wooden pail. Adjust all parts. Turn crank to see that everything is working properly.
5. With ice pick and mallet break the ice to pieces.
6. Put these pieces into the ice bag, tie with a cord, and with the mallet break the ice into *very small* pieces.
7. Mix in a pan three measures of ice to one measure of pulverized rock salt.
8. Pack freezer pail with ice and salt, being sure handle is in place before doing this.
9. Now remove handle and cover of can, *but do not remove dasher.*

Rules for Freezing

1. Pour in the mixture. *Do not fill can more* thas two-thirds full, and turn freezer *slowly* and *steadily* until mixture begins to stiffen, then turn *rapidly* until it is frozen.
2. Wipe off cover so that no salty water may get in. Uncover can, take out dasher and scrape clean. Pack mixture down with back of spoon. Cover closing hole in cover with a cork.
3. Run all water off from pail. Repack pail with coarsely chopped ice and salt. Use six measures of ice to one of salt. Cover freezer with newspaper.
4. Let stand for at least an hour to blend flavors.

Recipes

Rich Ice Cream

1 qt. cream
2 teasp. vanilla
4 tblsp. cold water
¾ c. sugar
1 tblsp. gelatine

Method.—

Scald 1 pint of cream. Add sugar, vanilla, and gelatine soaked in the cold water fifteen minutes. Cool, fold in the remaining cream, whipped stiffly. Freeze.

For caramel ice cream, sugar may be caramelized and added to scalded cream. For chocolate, melt ½ c. in the cream. For coffee, scald ⅛ c. coffee in cream and strain through cheesecloth.

Use more sugar—1c. with chocolate and coffee. For maple ice cream, use 1 pint maple syrup made into a custard, with 2 egg yolks.

Custard Ice Cream

1 qt. cream
1⅓ c. sugar
1 tblsp. flour
1½ tblsp. vanilla
1 pt. milk
1 egg
⅛ teasp. salt

Method.—

Scald milk, caramelize sugar and add to hot milk. Mix flour smoothly with some cream and thin down. Stir into hot milk and stir until it thickens. Beat egg, stir into it part of hot mixture and return to boiler. Cook until mixture coats spoon. Cool and add vanilla.

For chocolate ice cream—use ¾ c. chocolate melted in milk, instead of caramel. Add a little more sugar.

Maple Parfait

4 eggs
1 c. maple syrup
1 pt. of cream (for whipping)

Method.—

Make a custard sauce of syrup and eggs. Cool and fold in the cream, stiffly whipped. Mould, pack in a mixture of ice and salt (2 measures of ice to 1 of salt) and let stand four hours.

General Sherbet Recipe

For making any sherbet use twice as much water as juice and equal quantities of sugar and juice. Nearly all sherbets are improved by adding a little lemon juice. Make a syrup of sugar and water and for every quart of mixture dissolve 1 tblsp. softened gelatine in hot syrup, or fold in 2 stiffly beaten whites to partially frozen mixture.

Orange Ice

1¼ c. sugar
1 c. orange juice
1 tblsp. gelatine
2 c. water
¼ c. lemon juice
4 tblsp. cold water

Method.—

Make a syrup of sugar and water and while hot add to it the gelatine softened in the 4 tblsp. cold water. Strain in the fruit juice and add the finely grated rind of one orange.

Fruit Sherbet

To orange ice mixture, before freezing, add:—
1 can (pint) shredded pine apple
3 bananas
1 can peaches (pressed through a sieve.)
Freeze as orange ice.

Note:—Add 1 tblsp. extra gelatine and press only the bananas and peaches through sieve.

Sour Milk Sherbet

Yolk of 2 eggs
3 cups sugar
1¼ c. canned pine apple
Whites of 2 eggs
2 qts. sour, skimmed milk
Juice of 2 lemons.

Method.—

Add to the sour milk, sugar, pine apple and beaten yolks. When partially frozen, add the juice of 2 lemons, and fold in the stiffly beaten whites.

Note:—In place of the pineapple in the recipe one may use ½ c. strawberry juice or orange juice, thus making cherry, orange, strawberry, or raspberry sherbet. Concentrated fruit syrup may be used instead.

Sweet Milk Sherbet

1 qt. milk
2 cups sugar
3 lemons.

Method.—

Mix juice and sugar and add the thin lemon parings. Pack freezer and let milk stand until ice cold. Stir in lemon mixture (with parings removed) slowly.

Strawberry Ice Cream

3 qts. cream
2 cups sugar
2 boxes berries (4 c.)

Method.—

Wash and hull berries. Sprinkle with sugar, cover and let stand two hours. Mash in vegetable ricer. Partially freeze cream, add fruit and finish freezing.

Concord Ice Cream

1 pt. cream
1¼ c. grape juice
⅓ c. sugar
Lemon juice to taste.

Method.—

Let cream get very cold in packed freezer then add fruit juice and sugar, previously mixed.

Note:—

Freezing in small quantities

Put mixture to be frozen into a baking powder can or small tin pail with cover, and stand in a large pail or bowl. Pack ice and salt alternately around it. Remove cover and beat mixture with Dover egg beater until foamy, replace cover and turn can back and forth, remove cover occasionally and scrape the frozen mixture from the sides and beat *well* with a fork. The mixture will freeze in 20 minutes. When frozen place a narrow strip of cloth dipped in melted fat around the outside of cover to keep out the salt water. Repack and cover well until used.

F. E. CAMPBELL

COOKING DEMONSTRATIONS IN THE SCHOOLS

In Pontiac County

WHEN the school fair was held at Shawville last autumn it was remarked that there seemed to be no improvement in the quality of the exhibits in cookery from year to year. Miss Campbell, Demonstrator for the Quebec Homemakers' Clubs, drew the attention of the Homemakers' Club to this fact at the annual meeting of the County Executive in October. She also enlisted the interest of Mr. King, Macdonald College Demonstrator for Pontiac County, and offered to give demonstrations in the schools in order to instruct and encourage the girls in the making of bread, cake and candy, and to draw their attention to the method of judging these articles at the fair.

The various County Executives of the Quebec Homemakers' Clubs at once took up the suggestion, and in February arranged for demonstrations in the schools at Wyman, Elmside, Bristol, Austin, Stark's Corners, Murrells and Shawville. The average attendance at these schools was 28.

Later on in March Mr. King arranged for demonstrations at the following schools: No. 5 Bristol Mines; Shawville Academy (3 schools coming to Shawville for this purpose); No. 2 Bristol, Maryland; No. 9 Claredon, Yarm; No. 12 Clarendon, Charteris; No. 11 Clarendon, Morehead; No. 7 Bristol, Annesley. The average attendance was 25. The interest and enthusiasm of the pupils at all the schools was certainly most encouraging and augurs well for improvements in the exhibits of cookery at the next fall fairs.

Miss Campbell wishes to thank the Homemakers' Clubs, Mr. King, the teachers, parents and all those who so kindly contributed to the arrangements and success of the school demonstrations.

QUEBEC HOMEMAKERS' CLUBS

DURING the January Short Course the following Quebec Homemakers' Clubs were organized:—

Richmond County—

Kingsbury—
  Officers:—
    President—Mrs. A. Kerr,
    Vice-Pres.—Mrs. W. D. Jameson,
    Sec'y.-Treas.—Mrs. E. Millar.

Huntingdon County—

Dundee—
  Officers:—
    President—Mrs. James Arnold,
    Vice-Pres.—Miss May McGibbon,
    Sec'y.-Treas.—Mrs. R. G. Steven.

Drummond County—

Union Club (Ulverton)—
  Officers:—
    President—Mrs. Geo. T. Johnstone,
    Vice-Pres.—Mrs. A. J. Lyster,
    Sec'y.—Treas.—Miss Hilda E. Wright.

The organization of the club at Kingsbury is the second attempt made to introduce this work in Richmond County. The first was at Danville, where a large number of girls were present at the organization meeting. These girls were most anxious to have such a club, but owing to several obstacles, the principal one being the difficulty in securing officers among the senior members, the project was not a success. The organization at Kingsbury is now regarded as the first formed club in this county. With capable and energetic officers and enthusiastic members we hope for the success of this club, and the extension of the work throughout the county.

The club at Dundee is the second in Huntingdon County, the first being at Hemmingford.

The Union Club is the first formed club in Drummond County. With its capable officers and enthusiastic members it is hoped that the Union Club will have the honor of extending the work throughout Drummond County.

FOOD FOR CHILDREN

Practical Directions for Providing a Well-Balanced and Satisfactory Diet for the Child

SIMPLE bills of fare, helpful recipes, and practical directions for the preparation of foods for children between 3 and 6 years of age are contained in Farmers' Bulletin 717, "Food for Young Children", just issued by the U. S. Department of Agriculture. The bulletin, which was written by Caroline L. Hunt, under the direction of Dr. C. F. Langworthy, Chief of the Office of Home Economics, is easy to understand and should be helpful to mothers who are trying so to care for their children that they will grow up into stalwart and efficient men and women. It is issued as a coöperative contribution to the "Baby Week" campaign conducted by the Children's Bureau of the United States Department of Labor.

The author has carefully avoided the use of all technical dietary terms or systems of grouping and has so classified foods that any mother can meet the following definition of a satisfactory diet for a little child.

"A little child 3 to 6 years of age who is carefully fed in accordance with his bodily needs (as these are now understood) receives every day at least one food from each of the following groups:

"1. Milk and dishes made chiefly of milk (most important of the group as regards children's diet); meat, fish, poultry, eggs, and meat substitutes.

"2. Bread and other cereal foods.

"3. Butter and other wholesome fats.

"4. Vegetables and fruits.

"5. Simple sweets."

The relation of food to the condition of the bowels is also an important matter. Grains, particularly those containing the outer or branny layers or coats, are laxative; so, too, are such mildly acid fruits as apples, oranges, and grapefruit. So far, therefore, as the important matter of preventing constipation is concerned, coarse grains and mildly acid fruits serve the same purpose. When fruits are to be obtained in abundance, the kind of cereal served is not of great importance. When they are not, the coarser cereals should be used.

A QUART OF MILK A DAY

The basis of a child's diet should be clean whole milk—at least a quart a day. Such milk, in addition to water, contains about half a cupful of the very best food substances—butter fat, milk sugar, lime, and other materials needed by the child to make muscle, bones, and teeth. In addition milk contains a substance thought to promote growth by helping the body make good use of other foods. Where good whole milk is not obtainable, clean, fresh skim milk supplies these substances with the exception of the butter fat, and is, of course, preferable to dirty or questionable whole milk. Milk, however, contains very little iron and therefore spinach and other green vegetables and egg yolks, which are rich in iron, combine well with milk.

The child should drink the milk with the chill taken off, or should consume his full quart a day with cereals and in milk toast, cocoa, milk soups and stews, in cereal puddings, egg-and-milk puddings, custards, junkets, or simple ice creams. Milk stews may be made with vegetables or fish, or to vary the diet these things can be combined with cream sauce and served on milk toast. The bulletin therefore gives a large number of recipes for the preparation of various milk dishes which will help children consume the requisite amount of milk without growing tired of this valuable food. Those for milk soups will be found particularly useful, as they give the mother an easy means of preparing many vegetables which are essentials in the child's diet.

BREAD AND CEREALS

Well-baked bread and thoroughly cooked breakfast cereals are both good for children, and with milk should make up a large part of the diet. Bread and cereal mushes are to a certain extent interchangeable, but neither can take the place of milk, meat, eggs, fruits, and vegetables. An ordinary slice of bread is equal in food value to about half a cupful of boiled or steamed cereal and about a cupful of flaked or puffed cereal. Different kinds of bread may be used for variety.

The yeast-raised bread given to young children should be at least a day old or should be toasted or twice baked. Hot breads are likely to be swallowed in large pieces and are therefore not desirable. Hot breads which are almost all crust, like thin tea biscuits or crisp rolls, are best of the hot varieties.

MEAT, FISH, AND EGGS

Under the heading "Meat, fish, poultry, eggs, and meat substitutes", the author states: "In some families children do not get enough meat and eggs; in others they get too much. A good general rule commonly followed is to give a child 2 years old or over an egg every other day and about the same amount (2 ounces) of meat, fish, or poultry on the intervening days. Where meat is omitted care must be taken to see that other suitable foods take its place—preferably an extra amount of milk and eggs."

Fried meats should not be given to a child, because they are likely to be overcooked and tough, and also because the fat may be scorched and thus changed in composition. Scorched fat is almost certain to be hurtful to children.

Meat is best given as broiled chop meat or in simple meat stews combined with vegetables. Poultry may be boiled and served with rice. When roasted, only the tender portions should be fed. Highly seasoned stuffing or rich gravy should not be given to a young child.

Dried and other fish, and oysters, may be used in milk stews. Well-boiled fish is good for variety. Eggs must not be overcooked or they are likely to cause indigestion. The best way to cook eggs is to poach or coddle them. Scrambled eggs may be served occasionally, provided care is taken not to scorch the fat or to overcook the eggs.

FATTY FOODS

Fat is an important part of the food of children. There is more than an ounce of fat (at least 2½ level tablespoonfuls) in a quart of whole milk. If the healthy child is given a quart of milk, has butter on his bread, and meat or an egg once a day, he gets enough fat, and that which he received is in wholesome form. It is well, therefore, not to give such fatty foods as pastry, fried meats and vegetables, and doughnuts or rich cakes. If the child is constipated, the occasional use of cream or salad oil is desirable, for fat in abundance is laxative.

Bacon or salt pork, cut very thin and carefully cooked, may be given occasionally. It is very important not to burn the fat.

VEGETABLES AND FRUITS

Vegetables and fruits are grouped together because they are similar in that both supply iron, lime, and other mineral matters, and also mild acids. Vegetables are an important but often a neglected part of the child's diet. They should be served at least once a day, as they help to keep the bowels in good condition. Fruits are important for their flavoring, for their laxative effects, and doubtless for other reasons, and should be served in some form at least once a day. Fruit juices and the pulp of cooked fruit, baked apples and pears, and stewed prunes, are the safest. The child should not be allowed to eat the skins unless they have been made very tender by cooking.

SIMPLE SWEETS

Sugar is a desirable part of the diet provided it is given in simple sweets and not allowed to take the place of other foods and spoil the child's appetite. Simple sweets are such things as lump sugar, maple sugar, sirups, honey, and plain candy, and those foods in which sugar is combined in simple forms with fruit juices (in lemonade, water ice, jelly, etc.) with flour or starch, as in plain cakes (cup cake, sponge cake, cookies), and with fruit, as in jams, marmalades, and similar things.

His Progress.—"Last Christmas, before their marriage, she gave him a book entitled, 'A Perfect Gentleman'."

"Well?"

"This Christmas she gave him 'Wild Animals I Have Known'."—*Life.*

OF GENERAL INTEREST

ANNUAL FLOWERS

Many Plants Thrive When Transplanted from Seed Beds; Others Are Seriously Injured

THOSE planning their flower beds for the coming season should remember that certain annual flowers can be started in a seed bed and later transferred to a permanent bed, but that other annuals do not take kindly to transplanting. The following annual flowers which can be transplanted give particularly good results if started early in hotbeds or cold frames:

Ageratum,
Alyssum,
Aster,
Calendula or pot marigold,
Calliopsis,
Campanula,
Castor bean,
Chrysanthemum,
Cockscomb,
Cosmos,
Four-o'clock,
Godetia,
Marigold,
Petunia,
Sweet William,
Scotch pink,
Scarlet sage, and
Verbena.

Flowers for Outdoor Transplanting

The seed of some of the flowers listed below need not be started in hotbeds, but can be sown later in the season in the open ground and then transplanted to their permanent locations. The seed of these flowers should not be sown until the ground is in condition for making a good seed bed and until there is no longer likelihood of a heavy frost in the locality. A good test to determine whether the garden soil can be worked well is to take up a mass of it in the hand and compact it into a ball. If this ball readily falls apart, the ground is dry enough to be worked. It is particularly important in planting flowers to spade up the ground, fine it thoroughly with hoe and rake, and remove the stones and lumps from it. The actual surface should be made very fine and soft. In planting each kind of seed the directions as to depth of planting should be carefully followed. Flowers that can be sown in this way are:

Ageratum,
Alyssum,
Aster,
Pot marigold.
Calliopsis,
Campanula,
Clarkia (shade),
Cockscomb,
Dahlias, single,
Godetia,
Gaillardi,
Mignonette,
Pansy,
Pinks,
Rudbeckia,
Snapdragon,
Stocks,
Zinnias.

Most of these may be sown earlier in a hotbed or cold frame and thus be made to bloom sooner.

Annuals Injured by Transplanting

Certain flowers, however, die or do not do well if they are transplanted. These, therefore, should be sown only in the open ground or beds where the plants are to grow. The varieties which it is best to sow in a permanent location are:

California poppy,
Candytuft,
Corn flower,
Forget-me-not,
Lobelia,
Nemophila (shade),
Phlox drummondii,
Sunflower,
Sweet peas.

Sweet peas should be in the ground as soon as it is dry enough to work. The soil should be spaded up and well prepared and then a trench should be dug 4 inches deep; in the bottom of this the peas should be planted about 2 inches apart. When the peas are to be grown over chicken wire or brush stuck in the ground it is customary to sow them in two parallel rows, 6 or 8 inches apart. In this way on the same amount of trellis double the number of plants can be grown with satisfactory results. Sweet peas thrive best in a cool, moist climate. Because of this it is especially desirable to sow very early in the spring.

Poppies may be sown directly on the surface of ground that was prepared last fall. If the bed was not prepared at that time, it should be spaded up as soon as the ground is dry enough, and the poppy seed sown evenly over the surface. The seed should be slightly covered by drawing the back of the rake over the bed. Poppies do not stand transplanting, and must be sown where they are to bloom. Care should be taken to distribute the seed evenly and not in bunches, for if there is much disturbance of the roots at the time of thinning, the plants will not do so well as when left undisturbed. The Shirley poppy, a very showy and attractive variety, may be obtained in many colors. The individual blossoms, however, are very short lived, and as compared with many other plants its blooming season is short. The plants are so attractive when in bloom, however, that they are well worth planting. A succession of sowings will prolong the blooming season.

The California poppy should also be sown early, but does not require as early sowing as the other poppies. It is handsome and will bloom during a longer period than the Shirley poppy.

The other plants in the list may be sown in a seed bed and be transplanted from there to the permanent location, but it is usually better to sow the seed in the permanent location.

Balsams or lady's slippers, castor beans, and portulaca also are best sown where they are to grow, but they should not be put in the ground until it is warm enough to grow beans and tomatoes well; that is, about the time corn is coming up or oak leaves are half grown. These plants could be grown in a cold frame previous to this date, but there is little to be gained from this method.

Weekly News Letter

WHAT WE NEED AS FARMERS

JUST now there are all sorts of theories put forth as to the need of the farmer—agitation on the subject of farm credits, increased marketing facilities, more and better co-operation along the lines of production of farm products, their sale and proper preparation for the consumer. All these and many more worthy subjects are being pressed upon the attention of the farmer. Why? For the reason that the one

THE ROOFING YOU WILL EVANTUALLY BUY

And for many reasons you will learn. The durability, the costing price, the facility of laying, the guarantee of the LEGARE firm.

Prices of shingles and galvanized steel advance every day and you have to pay the workmen to lay them, while the prices of our ASPHALT ROOFING are always as low as before, you can lay it yourself and we give you a FULL GUARANTEE.

TWO BRANDS

RUBY a pure asphalt product | RUSTIC with sanded surface | In rolls covering 100 square feet of surface.

FREE SAMPLE BOOKS

Write for them to-day and for prices and terms.

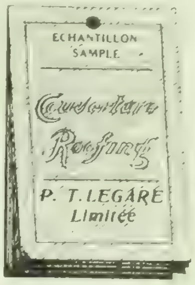
YOU WILL GET THIS ROOFING

At all our branch stores and local agencies.

AT QUEBEC
273-287 St. Paul St

AT MONTREAL
180 Amherst St.

P. T. LEGARE Ltd.
QUEBEC.



This Knapsack Spramotor

It isn't a SPRAMOTOR unless we made it

Complete with attachments $18.00

The illustration gives you a pretty clear idea of the Knapsack SPRAMOTOR in action. It is made entirely of brass, except the shoulder straps, which are of wide heavy grained leather, and the handle which is of spring steel. It is light, strong and durable. The tank or Knapsack—made of cold-rolled 16-ounce polished brass—has a capacity of 5 gallons. The discharge and air chamber tubes are pivoted on the top of the tank on a single bolt, thus permitting the SPRAMOTOR to be swung from right to left at will, allowing you to change hands instantly while at work. All the labor is done on the down stroke. Operates so simply that any one can master it in a few minutes. Everything is so clearly and plainly told in our book of instructions that you can go ahead and work it the same day you receive it. Drop a card for booklet. Made in Canada. No duty to pay.

HEARD SPRAMOTOR LIMITED,
2805 KING ST., - LONDON, CANADA.

The Green Silo

is made cylindrical without exception.
Its door are shaped to the diameter of the silo.
This, as you know, is very important to press ensilage evenly.
Its doors are also made to be used as ladder.

Safety First.

Don't make a mistake. Choose the best.

The Plessisville Foundry
Plessisville, Que.

first and greatest need of the farmers must be met before these other things can follow. What is that need? A broader cultivation of the mind, so that we as farmers can successfully grasp these problems of the farms. We do not realize as we should that the isolation of our farm life breeds a mental sloth and indifference, makes us dull and unresponsive to mental action. As a consequence all these good things that are put before us for our adoption are imperfectly comprehended. We must comprehend better than we do the true philosophy and effect upon our minds of the kind of a life we are living. We must see that it is not our toil that makes us what we are so much as a lack of contact with one another and the outside world. The cities and villages are the great centers of mental activity. Why? Not because the people there toil less, but rather that they have greater and more frequent contact with each other.

The old Bible was right when it said, "as iron sharpeneth iron so does the countenance of a man that of his friend". Larger contact makes the city and village people more keenly alive to what they need as a class. Hence they co-operate together more readily to obtain what they need in the way of education of their children, the building of good streets, sewerage, electric lighting, and the agitation of public questions that affect the welfare of all.

Of course the concentration of life in these centers brings with it certain evils. Any form of life has its own evil, farm life as well as all others. But the great fact remains that close contact among men promotes mental activity and a lack of that contact promotes mental dullness. Now right at this point occurs the supreme need of every farmer's life. He must make extra effort to arouse his powers of mind, to increase his intelligence in order that he may see in their right light the problems that confront him. To this end he must become his own schoolmaster; supply himself with that class of reading that will stimulate his power to think and exercise good judgment.

THE SCHOOL AND FARM OF THE FUTURE

BEVERLY T. Galloway, dean of the New York State College of Agriculture, at Cornell, spoke at the convocation of the University of the State of New York on "The School and the Farm of the Future." He outlined his conception of the future farm and its place in the life of the nation, then analyzed the forces which are making for rural development in this country, and gave his ideas of the proper organization of these forces to secure a permanent agriculture and a satisfying country life.

The great problem, according to Dean Galloway, is whether the United States will be able to develop a permanent agriculture without peasantizing those who must look to the land for a living. None of the Old-World countries, he says, has succeeded in doing this. He spoke in part as follows:

"Wherever is found a permanent and successful agriculture, measured merely by the maintenance of soil fertility and high average crop yields, there is found to be a peasantized and labor-depressed people, whose days are full of toil, and whose minds have never been given much opportunity for growth.

"Even in this country, more than a million farmers live and support their families on a labor income of less than a hundred dollars a year, and very little of this income actually comes to the farmer as money. So, despite all that has been said regarding the delights, the independence, the freedom, and the self-sufficiency of the farm, people are turning from it.

"While there has been a steady decrease in the percentage of our population engaged in agriculture, the per capita production of our staple crops has been increasing. This is primarily due to the utilization of machinery, making it practicable to more and more utilize horse power and other power instead of man power.

"Despite the fact that in practically all other countries the intensity of the farming has increased with the density of population, this need not follow here. It would be unfortunate if it did follow, because an intensive agriculture has been practicable only where there is an over-supply of human labor. The bountiful crops from small areas have been made possible only by the toil and sweat of the man who, while he is able to produce these results, must do so at the expense of the mental, and I might almost say moral, side of his being. This is agricultural peasantry in its worst form, and, while much may be said on the subject of making two blades of grass grow where only one grew before, we do not want to accomplish this object by sacrificing the very things that make life worth living.

"The farm of the future will so utilize modern labor-saving devices and efficiency methods that human labor will be reduced to a minimum, and the farmer and his children will have time, opportunity and means of living a satisfactory, wholesome life. It will probably mean a farm of average size.

"We may look forward to a permanent husbandry, freed from the blight of peasantry, standing squarely for its place in the affairs of the nation, but recognizing its relations and responsibilities to other industries, and recognizing further that the fullest and best development of one can be attained only through the fullest and best development of all.

"The demand is for education that will teach the meaning of things and their relation to the present, rather than the teaching of words and their relation to the past. I am not so much concerned with making more farmers as I am with making better ones.

Barrett Made in Canada

Money Savers for Farmers

Seven good products good in more than Seventy different places

YOU can't beat arithmetic. When you buy something that has a limited usefulness your purchase is almost a luxury. But when you buy articles that you can use every day around the farm you purchase money-saving utilities. Such is the line of Barrett Money Savers. Every one is a quality leader of its kind. Every one comes from the home of business success. Every one will put money in your pocket at some time or other by saving you costly repairs, renewals or deterioration. Look over this advertisement and see if you are not struggling along without something you ought to have and can have for the minimum outlay.

EVERJET Elastic Paint is the best thing you can use on smooth-surfaced or metal roofing, on agricultural implements, structural iron work, fences and exposed surfaces. It is elastic, adhesive, and will not rub, crack or peel. Good in any climate. Don't let your implements or iron work deteriorate by rusting. Use Everjet Paint. It's permanent, cheap, and has great covering capacity.

YOUR live stock will be free from annoyance by insects, flies, lice and vermin if you spray them lightly with Creonoid, the peerless lice destroyer and cow spray. Not a deodorant, but a destroyer. It helps to make healthy, happy horses, contented cows and placid-minded pigs. You know that vermin-infested live stock can't be profitable. Give them a chance. Use Creonoid in the barn, the pig-sty, the poultry house. You'll see a difference. Sold in 1, 5 and 10 gallon containers and in half and full barrels.

HERE is a ready roofing that needs no painting or other attention to keep it watertight. Amatite Roofing has a mineral surface that laughs at wind and weather. Very attractive because of its bright, sparkling appearance. Wherever you have steep roofs, you need Amatite. Amatite is made in rolls of 110 square feet with galvanized nails and cement in center. Try it.

HERE is a ready roofing that should not be overlooked. Everlastic is a "Rubber Roofing" of wonderful toughness and durability. You can't beat it for use on any steep roof. Inexpensive, easy to lay, and will be on the job keeping out water for years.

CARBONOL is a household wonder. It cleans, heals, disinfects, purifies. If you cut your hand, apply Carbonol in weakened solution. If your live stock get bruised, Carbonol will fix them up. If your house, barn or poultry house needs disinfecting, there is nothing like Carbonol. And it is wonderfully effective as a destroyer of vermin. Carbonol belongs on every farm in Canada.

YOU know the wonderful preserving qualities of Creosote. Well, Barrett's Grade One Creosote Oil is the greatest product ever turned out in commercialized Creosote. It will insure your woodwork against decay. Applied to the posts of a fence it will add 15 years to that fence's life. By actual tests, it penetrates farther than any other preservative.

Barrett's Grade One Liquid Creosote Oil

FOR the quick repairs that are daily necessary on the farm, you need Elastigum. It is an elastic, waterproof cement. It is tenacious and durable. Just the thing for joining and relining gutters, flashings around chimneys, sealing leaks in exposed places, renewing gutters, stuffing cornices and putting glasses in greenhouses or skylights. It is easy to apply, is acid-proof and damp-proof and it "sticks".

Send for illustrated booklet describing Barrett Money Savers in detail. Address nearest office.
For sale by good dealers everywhere.

THE PATERSON MANUFACTURING COMPANY, LIMITED
MONTREAL TORONTO WINNIPEG VANCOUVER
THE CARRITTE - PATERSON MANUFACTURING CO., LIMITED
ST. JOHN, N. B. HALIFAX, N. S. SYDNEY, N. S.

POTATOES PRODUCERS

Our pure Paris Green will save your crops.

ORCHARDISTS

Our lead arsenate, in paste or in powder and our sulphur emulsion will successfully destroy pests and scab.

Ask for them from your dealer.

The Allan Munro Color Company Limited

Manufacturers of Chemical Colors, **41-45 Britannia Street**

"The school must concern itself more and more with the needs of the people, and be more of a community center, with the teacher as a community builder.

"The mere introduction of 'agriculture" into the school will not accomplish the ends desired; and it must be fully realized that the school is not for the preparation of life, but is life itself.

"If it is vital that the people of the open country learn to work together in matters affecting their economic and social welfare, it is even more vital that those who are directing the forces in the field of education and redirection of rural affairs should also strive to bring about unity of purpose.

"Probably one of the greatest and most potential forces for bringing about and welding together the agencies that are to advance agriculture is to be found in the recent federal law known as the Smith-Lever extension act. This measure, for the first time, develops as a dominant factor the idea of cooperative effort. The principle that the federal government will help those states whose people are ready to help themselves in a financial way, is unique in federal legislation."

In conclusion, Dean Galloway quoted the following paragraph from the report of the Country Life Commission:

"The great recent progress made in city life is not a full measure of our civilization; for our civilization rests at bottom on the wholesomeness, the attractiveness, and the completeness, as well as the prosperity, of life in the country. The men and women on the farms stand for what is fundamentally best and most needed in our American life. Upon development of country life rests ultimately our ability, by methods of farming requiring the highest intelligence, to continue to feed and clothe the hungry nations; to supply the city with fresh blood, clean bodies, and clear brains, that can endure the terrific strain of modern life; we need the development of men in the open country, who will be in the future, as in the past, the stay and the strength of the nation in time of war, and its guiding and controlling spirit in time of peace."

A LEGEND

DO you remember it? The ancient legend of the man facing the great day of final reckoning. He had lived as well, perhaps, as most of us while here below. At last he stood before the Judge of all the earth. His record was unfolded. The face of the Judge seemed to him to grow clouded as he traced its story. The record was pushed aside. The eyes of the Judge were lifted till they rested on the man. The lips were parted as if the sentence were about to fall. Suddenly from every quarter there gathered a host of shining forms which pressed about the august judgment seat. They appeared to be in conference with the Judge. It looked as though with eager faces they were urging certain claims. Then they vanished from sight as mysteriously as they came. The Judge smiled, turned toward a messenger clad in the radiant robes of his office, and bade him conduct the man, whose case he had just considered, into the realms of the blessed.

As they moved away the man said to his guide, "Tell me who were those who just now stood in such numbers about the Judge and held converse with Him?" "Those," replied his conductor, "were the friends who saved you. They were the deeds of kindness and of unselfish service you scattered far and wide while you lived on earth."

Did Wordsworth have this legend in mind when he wrote in "Lines on Tintern Abbey,"

"feelings, too,
Of unremembered pleasure; such perhaps,
As may have had no trivial influence
On that best portion of a good man's life,
His little, nameless, unremembered acts
Of kindness and of love."

Dumb Animals

LOOK FOR YOUR MONEY WHERE YOU LOST IT

SUCH was the counsel of a wise father to his son. The boy had failed in some project he had undertaken. Just what it was, we do not know. He might have lost a crop of wheat because of a hail-storm and been afraid to try wheat again. It may be that he lost a drove of hogs with cholera and declared that he would never again raise hogs. Possibly it was new to him and he was not onto the "how" of doing it. Sometimes a person learns more when he fails than when he succeeds. It is the schooling of experience that counts.

A man may fail to make money on a farm. He may find it harder work than he had thought. That is no indication that he should quit. He is only preparing to begin. Of all lines of business, farming is certainly the most flexible in this respect. Every man has within his own power the possibility of increasing or decreasing the profits, of making his work heavy or light according to his managing ability.

The use of proper farm records will show up the why and the wherefore of a lot of the leaks. Plugging up the leaks is one good way of increasing profits. Put down what you do and where you did it, what you spent and where you spent it, what you received and from whence it came. Then at the end of the year look over your record and see how much you did and what you got for doing it. Quit guessing. A guess is dangerous if you rely upon it for dollars and cents.

Some methods of keeping records are easier than others. Get a simple and complete method and you will enjoy keeping a good record.

FUMIGATING FOR FUNGOUS PESTS AND BAD ODORS

Simple Formula which will "Do The Business"—Directions for Use

IT is often necessary to fumigate cellars or storage rooms in order to get rid of fungous pests. If a bad odor is present, due to the products of decay, fermentation, and decomposition, this condition can also be removed by the use of a proper fumigant.

The best disinfecting and deodorizing agent is formaldehyde. For each 1,000 cubic feet of space use the following:

Potassium permanganate (crystals) 11 oz.

Solution formaldehyde (40 per cent) 11 oz. and water 9 oz.

The cellar or storage room should be prepared for fumigation. The door should be close-fitting and made tight by means of pieces of felt or wet newspaper strips tacked to jams and threshold. All cracks, windows, ventilators, etc., should be sealed with wet newspaper strips or with felt. Prepare wet strips of paper beforehand to seal the last door after starting the disinfection.

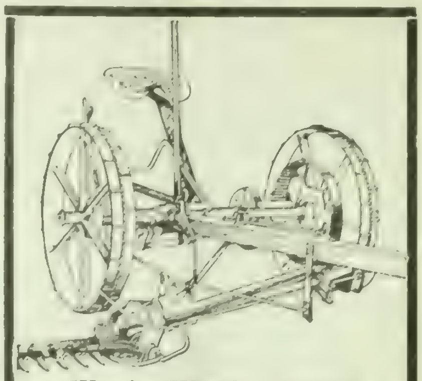
Prepare fumigant as follows: Use an earthenware receptacle or a metal pail with lapped (not soldered) seams, holding not less than fourteen (14) quarts. Place the vessel on bricks which are standing in a pan of water. Moisten the walls and floor of room by sprinkling with boiling water. Next distribute the 11 oz. of potassium permaganate evenly over the bottom of the vessel. Mix the formaldehyde solution (11 oz.), and the water (9 oz.,) and pour over the permanganate in the dish.

The operator should leave the room as quickly as possible and seal the door with the wet strips of paper. Leave the room sealed over night after which it can be opened and aired out.

If the room contains more than 1,000 cubic feet of space, use one of the above receptacles for each 1,000 cubic feet or fraction thereof. Never use a double charge in one receptacle holding fourteen quarts.

THE IMPORTANCE OF PHOSPHATIC FERTILIZERS

While a growing plant requires a number of chemical elements for its perfect development, three of these are especially necessary, namely nitrogen, potassium and phosphorus. These three substances are taken from the soil in such large amounts by growing crops, that, unless very special precautions are taken, the supply of these elements in the soil becomes greatly diminished and the fertility of the soil gradually declines until it can no longer be cultivated with profit. This is, briefly stated, the cause of the progressive exhaustion of the land which has had such far-reaching consequences in so many portions of the world.

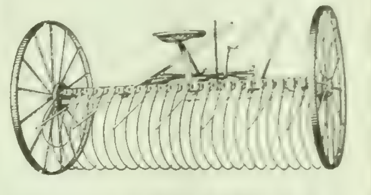


W. A. Wood Vertical
LIFT MOWER
4½, 5 and 6 feet cut
The mower with the greatest capacity. The most effective under any conditions. Light of draft. Write.

Rake
Automatic dump, all steel rake, also the Ithaca rake with wooden or steel wheels.

Write for Catalogue
Which will show you all these machines.

We supply all accessories for unloading outfits.



P. T. LEGARE Ltd.
QUEBEC

FOR SALE
AYRSHIRES AND YORKSHIRES—Ayrshires male and female all ages. Bred from 1st prize stock and from deep milking strain. Improved large Yorkshire pigs $6.00 or if registered, $7.00 each, when 5 to 6 weeks old. Send in your orders now, stating when you wish pigs shipped. Apply to HON. W. OWENS, Proprietor or ROBERT SINTON, Manager, Riverside Farm, MontBello, Que.

FOR SALE—Silver Campines, Limited number of settings at $1.00 for 15 eggs. According to the rigorous climate in Quebec they have proved the best everlasting layers. Send for catalogue. ERNEST BLONDEAU, Loretteville, P. Que.

ABSORBINE
TRADE MARK REG.U.S.PAT.OFF.
Reduces **Strained, Puffy Ankles, Lymphangitis, Poll Evil, Fistula, Boils, Swellings; Stops Lameness** and allays pain. Heals **Sores, Cuts, Bruises, Boot Chafes.** It is an
ANTISEPTIC AND GERMICIDE
NON POISONOUS,
Does not blister or remove the hair and horse can be worked. Pleasant to use. $2.00 a bottle, delivered. Describe your case for special instructions and **Book 5 K free.**
ABSORBINE, JR., antiseptic liniment for mankind reduces Strains, Painful, Knotted, Swollen Veins, Milk Leg Gout. Concentrated—only a few drops required at an application. Price $1 per bottle at dealers or delivered.
W. F. YOUNG, P.D.F. 134 Lymans Bldg., Montreal, Can.
Absorbine and Absorbine, Jr., are made in Canada.

Bowker's
Fertilizers
Ask Canadian Local Agents for prices, or write us
Bowker Fertilizer Co.
BOSTON

Taking the wheat crop, merely as an index of yield, the result of continuous cropping in the United States without an adequate return to the soil of the constituents removed from it, is set forth in a recent Bulletin of the United States Federal Department of Agriculture as follows:

"Wheat was successfully produced in central New York for something like 40 years. During the latter part of that period the yield began to decline, and at the end of another 20 years it was so low that exclusive wheat growing became unprofitable. Ohio, Indiana, Illinois and Iowa have each in turn repeated the history of New York. The soils of these states were productive in the beginning, and it required 40, 50 or 60 years for the single crop system to materially reduce the yields."

Now in the Eastern States are found in many regions abandoned farms with farm houses in every stage of decay. The average yield of wheat in New York state as recently as 1898 was 21.2 bushels per acre; in 1907 it was 17.3 bushels. In the same short time the average yield in Indiana fell from 15.6 to 14.4 bushels; in Minnesota from 15.8 to 13 bushels; in North Dakota from 14.4 to 10 bushels; in Oklahoma from 14.9 to 9 bushels.

The nitrogen which is taken from the soil by growing crops may be returned to it by ploughing in crops of clover, which have the power of fixing the nitrogen of the air and conveying it to the soil in the form of certain nitrogen compounds. It can also be supplied directly to the soil in the form of ammonium sulphate, which is now obtained in large quantities as a by-product in the coking of coal, or in the form of certain other nitrogen compounds manufactured from the air by certain electrical processes.

Potash, which is of equal importance, is usually present in soils in relatively larger amount, although in all processes of intensive farming by which especially large yields are obtained from the soil, this substance is returned to the soil through the medium of some kind of fertilizer.

Phosphorus, in the form of some phosphate, is of very especial importance, and if no steps are taken to restore to the soil the supplies of this substance abstracted and removed by the crops, the soil becomes gradually impoverished and will finally cease to produce a profitable yield.

Dr. C. G. Hopkins, in his book on "Soil Fertility and Permanent Agriculture", page 183, states that:

"Phosphorus is the only element which must be purchased and returned to the most common soils of the United States. "Phosphorus is the key to permanent agriculture on these lands." To maintain or increase the amount of phosphorus in the soil makes possible the growth of clover (or other legumes) and the consequent addition of nitrogen from the inexhaustible supply in the air; and, with the addition of decaying organic matter in the residues of clover and other crops and in manure made in large part from clover hay and pasture and from the larger crops of corn and other grains which clover helps to produce, comes the possibility of liberating from the immense supplies in the soil sufficient potassium, magnesium and other essential abundant elements, supplemented by the amounts returned in manure and crop residues, for the production of large crops at least for thousands of years; whereas, if the supply of phosphorus in the soil is steadily decreased in the future, in accordance with the past and present most common farm practice, then poverty is the only future for the people who till the common agricultural lands of the United States.

"And this does not refer to the far distant future only, for the turning point is already past on most farms in our older states and on many farms in the corn belt; and lands that have passed their prime with sixty years of cultivation will decrease rapidly in productive power and value during another sixty years of similar exhaustive farm practice."

In 1914 the wheat production of Canada amounted to 158,223,000 bushels—the average yield per acre being about 15.37 bushels. Allowing two pounds of straw as removed for every pound of grain, and taking the average analysis of wheat and straw, the following amounts of plant-food were removed from the soil during that year by the wheat crop alone.

Nitrogen	300,000,000	pounds.
Phosphoric acid .	95,000,000	"
Potash	137,000,000	"

While the virgin soils of the western provinces of Canada and especially the very deep rich soils of Manitoba, continue for years — and in some cases for many years — to produce heavy yields even under continuous cropping, they are by this process being gradually depleted, and as the supplies of plant food in them become gradually reduced, the signs of exhaustion will be manifested in decreasing returns. As a matter of fact, this depletion is already manifesting itself as shown by an investigation recently carried out by the Commission of Conservation.

In order to maintain the fertility of the soil, these valuable constituents taken from the soil must be returned to it. Of these, as has been mentioned, the most important is phosphoric acid.

In 1913 there were 16,726,400 acres of land under cultivation in the three Prairie Provinces and the depletion per acre annually may be taken as equivalent to the phosphoric acid contained in 60 pounds of high-grade phosphate rock. At this rate 501,800 tons of high-grade phosphate rock would be required each year simply to offset the depletion of the land already under cultivation in Manitoba, Saskatchewan and Alberta.

The heavy winter milker is usually the best and most persistent cow; give her an opportunity *to make greatest profits.*

"Odd Furniture will Fit in"

Says Mrs. Goodwife:—

"The prized heirloom, that odd but dainty design of former days, can be renewed and made to fit in any modern home with a coat to match of

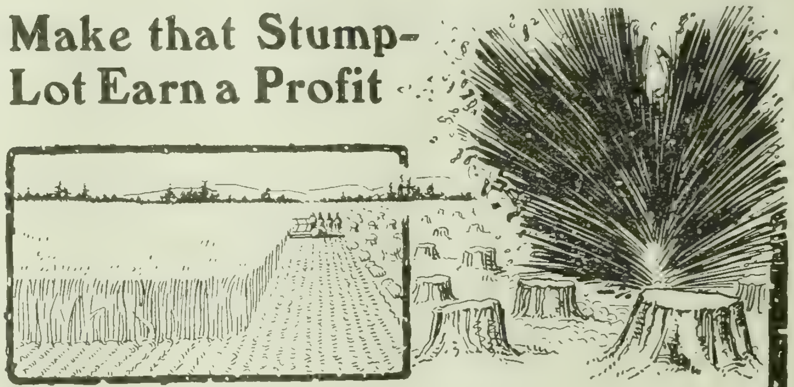
FLOGLAZE

"The Finish that Endures"

Enamels *Lac-Shades*

Floglaze finishes and renews Furniture, Woodwork, Floors, Wickerwork, Verandah Furniture. Wagons, Buggies or Automobiles. Write us for color card, and send 10c in stamps for sample tin of any color Lac-Shade.

THE IMPERIAL VARNISH & COLOR CO. LIMITED
WINNIPEG TORONTO CANADA VANCOUVER



Make that Stump-Lot Earn a Profit

Get the benefit of the soil that has been storing up fertility for years. Blast out the boulders, blow up the stumps—and you will have a productive field where waste land now exists.

Use C.X.L. Stumping Powder

the one effective and economical means of clearing your land.

C. X. L. Stumping Powder blows out your stumps, digs your ditches and tree holes and is the quickest and cheapest means of doing excavating work on your farm.

There is big money in agricultural blasting. Write for proposition.

Our free booklet "Farming with Dynamite" tells all about the uses of C. X. L. Stumping Powder. Send for your copy today.

Canadian Explosives, Limited
804 Transportation Bldg.,
Montreal.
Western Office, Victoria, B. C.

CANADIAN EXPLOSIVES LIMITED TRADE CXL MARK

The JOURNAL of AGRICULTURE
AND HORTICULTURE

Volume 19 *June 1st 1916* *Number 12*

THE GRADUATING CLASS IN AGRICULTURE AT MACDONALD COLLEGE, MAY, 1916.

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE OF
THE PROVINCE OF QUEBEC.

Made in Canada.

Tarvia

Preserves Roads
Prevents Dust—

The Better the Roads
The Better for You----

Taxpayers are too often uninterested in the question of economical road building and maintenance of their roads in spite of the taxes they pay annually to support the work of their town authorities. The experience with Tarvia of scores of progressive Canadian cities, towns and villages conclusively proves that its use is a big investment in economy, satisfaction and comfort to every taxpayer.

Perhaps you would like to know how Tarvia roads are made.

The old way in building macadam was to use water as a binder.

But a water-bound macadam wears out quickly under the prying strain of the automobile driving wheels and the horses' hoofs. You know how that strain loosens the surface, grinds it into clouds of dust, makes heavy mud, and leaves the road full of holes.

"Tarvia-X", in the place of water, makes a surpassing binder, penetrating, plastic, and waterproof.

The first cost of making a tarvia-macadam costs but a little more than the old-fashioned macadam, but the saving in maintenance more than pays this difference. So Tarvia costs you nothing!

"Tarvia-A" is, practically a thin "Tarvia-X", used for recoating the surface of a macadam road already built. It is applied hot and adds greatly to the life of the road. It keeps the road dustless, smooth, and inviting to traffic.

"Tarvia-B" is a much more widely applicable preservative. It is applied cold. It is thin enough to sink quickly into the road and yet strong enough to bind the surface particles together into a mudless, dustless, durable surface.

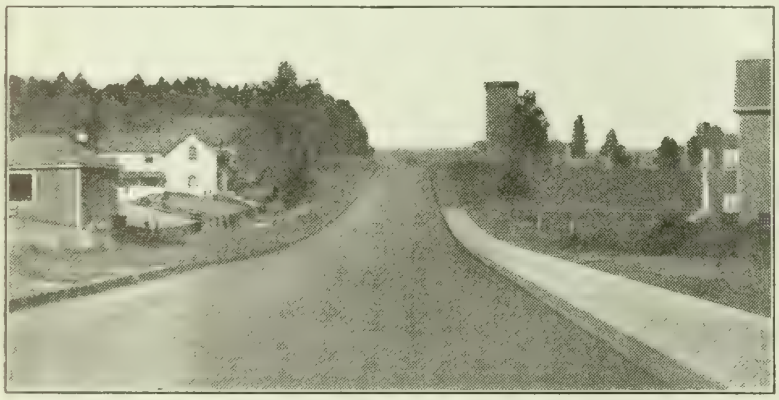
"Tarvia-B" offers the lowest cost of road maintenance yet invented. It can be used effectively, for repairing and preserving macadam roads under varying conditions of traffic and situation. It may even be used effectively on certain classes of gravel, shell and adobe roads.

If you want better roads and lower taxes, our Special Service Department can greatly assist you. Write to nearest office regarding road conditions or problems in your vicinity and the matter will have the prompt attention of experienced engineers. This service is free.

Write nearest office for free illustrated booklet.

THE PATERSON MANUFACTURING COMPANY, LIMITED
MONTREAL TORONTO WINNIPEG VANCOUVER

THE CARRITTE-PATERSON MANUFACTURING CO., Limited
ST. JOHN, N. B. HALIFAX, N. S. SYDNEY, N. S.



High St., Port Arthur, Ont. Treated with "Tarvia-B" in 1914.

DAIRYMEN

What do you know about *Dried Brewers' Grains* as a Milk-Producing Feed for your Cows?

DID you know that feeding these Grains will **increase the milk yield** of your cows?

DID you know that these Grains contain **more milk-producing and flesh forming material** than bran?

DID you know that these grains **cost less** than bran—that cattle like them better than bran?

Dried Brewers' Grains

contain all the rich Protein, Gluten and other Nitrogenous materials of the choicest Canadian barley. We have our own special plant for drying these grains. Every particle of moisture is removed by dry heat, so that the grains will keep sweet and clean.

A TON of Dried Brewers' Grains is a ton of solid nourishment for your cows.

WRITE for a sample of our Dried Brewers' Grains and test them for yourself. They are cheap and good.

Molson's Brewery Limited

ESTABLISHED 1786

906 Notre Dame Street East, - - - - Montreal.

Another year of this?

Lugging in wood. Huddling over stoves. So much work—so little cheer.

Be thankful the winter is over, and plan NOW for the next winter's siege of zero weather. Why should you endure pioneer-day hardships? Comfort is just around the corner. Your home, no matter how it is built, can be made just as warm and cheery as a modern city house.

HECLA a Clare Bros FURNACE

Hecla Heating is not costly

Decide to have it — TO-DAY. Mother will agree to it. The best news you could bring her would be that you had ordered a Hecla Furnace, and that next winter your whole house would be warm. There, is a deal you can make in happiness, that will pay you and all your family, dividends of joy every winter for the rest of your lives.

Because with the Hecla Furnace you buy warmth-guaranteed. No man need hesitate for a minute. There is no risk. We will plan your heating system, put it in, and guarantee that it will keep your home heated to your satisfaction. Once you instruct us to go ahead, the responsibility of making your home comfortable is ours.

$90 to $150

To make your home a real HOME, winter as well as summer, costs what? Anywhere from $90 to $150, depending on the size and style of your house. That is all that stands between winter chill and winter cheer. That will make a bright healthy home where mother can spend the long winter enjoyably. That will give you early morning and day-long comfort. That will bring your friends and your family to look on your home as the best spot on earth. That will make you rightly proud of your home.

Hecla Burns Wood as Well as Coal

Hecla heating, you have likely heard, is economical. Spring and fall you can burn wood in the Hecla. It is made especially for the purpose. The Hecla has the patented STEEL-RIBBED Firepot, with its triple heating surface. That is the feature that saves one ton of coal in seven.

Hecla Warm Air is Mellow

Dust or gas can never escape from the Hecla. This is another exclusive Hecla feature. FUSED JOINTS—our patent — never leak. We guarantee that for the life of the furnace.

The moisture supply in the Hecla is so liberal that dryness in the air is unknown.

Hecla Avoids Waste

The Hecla can be checked down to hold the fire for hours without waste. This is because of good tight workmanship. The fire is shaken down with four separate grate bars. Live fire need never be dropped with the ashes. Waste of coal is guarded against at every point.

CLARE BROS. & Co. Ltd,
Preston - Ontario.

Any reader of the Journal of Agriculture who would like to plan now for the day when he will instal a heating system in his home is welcome to the help of our heating experts.

Without cost, and without obligating yourself to buy, you may have full information on the subject. If you wish we will send you specifications, plans and estimates of the cost. You will be supplied with literature about heating to study out at your leisure.

The Hecla Furnace will be described fully and in a very interesting way.

You will be told where you can see the Hecla and examine its patented features.

You will be given the names of neighbours of yours who have Hecla Furnaces in their homes.

You will have in very complete form all the information that you require to plan ahead for next winter, or a year or so hence, when you will be ready to modernize your home.

This will be sent to you immediately on receipt of your letter asking for it, and mentioning the Journal of Agriculture.

ISSUED
MONTHLY
BY THE
DEPARTMENT OF
AGRICULTURE
OF THE
PROVINCE OF
QUEBEC.

All matters relating to the reading columns must be addressed to Prof. W. Lochhead, Macdonald College P. O., P. Q.

The JOURNAL of AGRICULTURE

AND HORTICULTURE

FOR RATES
OF ADVERTISEMENTS,
ETC., ADDRESS
THE CANADA
PUBLISHING CO.,
Limited,
73 St-Jacques,
Montréal.

Circulation - 89,981
ENGLISH, 7,311
FRENCH, 82,670

Volume 19
JUNE 1st 1916
Number 12

EDITORIAL

THE CIRCULATION OF THE JOURNAL

THE circulation of the English edition of the Journal of Agriculture was 9820 for the April issue and 7397 for the May issue. At first thought the Editors were inclided to believe that the information given out each month was not of sufficient interest to many of the English farmers of Quebec to lead them to renew their subscriptions. On second thoughts, however, it was felt that this could not be the real reason for the great falling off in circulation, for the farmers with whom we came in contact seemed well pleased with the large number of timely and practical articles that appear in every issue.

When we remember that the subscription list is almost entirely in the hands of the secretaries of the Farmers' Clubs and Agricultural Societies, and that many secretaries are not careful to keep their members in good standing, it is readily apparent how the circulation might fall off. We feel confident that this is the real reason for the large drop in circulation.

No doubt many farmers will immediately pay their membership dues when they find that they no longer receive the Journal. They cannot afford to do without it, and we submit that secretaries are lax in their duties when they do not keep their members up to date.

We hope to see the normal circulation restored in a few months, when the secretaries and the old members get into touch again.

THE NEW AGRICULTURAL WAR BOOK

THE Agricultural War Book for 1916, entitled "Production and Thrift," and having for its particular text:

IN WAR TIME
Produce more and save more,
Make your labour efficient,
Save materials from waste,
Spend your money wisely,

consists of 250 valuable and instructive pages. Opening with a brief address to the Farmers of Canada by Hon. Martin Burrell, Federal Minister of Agriculture, under whose direction the book has been issued, followed by extracts from the Budget Speech of Sir Thomas White, Finance Minister of the Dominion, and an article bearing upon the national income and expenditure of the United Kingdom, there ensue contributions from over seventy expert authorities on different branches of agriculture. including the compiler and editor of the work, the Federal Commissioner of Agriculture and the Commissioner of Live Stock and Dairy Products of the Dominion, the Director of Experimental Farms, chiefs and sub-chiefs of departments of Agriculture of all the provinces and a number of professors at the different agricultural colleges. A vast deal of general information, statistical and otherwise covering various countries as well as Canada, is given along with a large fund of sound advice and counsel bearing in particular upon the subjects embraced in the title. Although primarily devoted to agriculture, there is much matter that the general citizen will find of interest. Among other things he will be rather surprised to learn that wheat in 1801 was $3.47 a bushel in Britain, while last year it was only $1.61, the latter, however, being nearly twice as much as the lowest point reached, which was in 1894, when the price was down to 68 cents. For the first fifteen years of this century the average price of wheat per bushel in Britain was 98 cents, whereas in the fifteen years of the nineteenth century the average was something like $2.66.

The Educational Committee of the Council of Agriculture

While crop production occupies a large space, live stock comes in for a large share of attention, horses, cattle, sheep, swine and poultry all being learnedly dealt with along with dairy products and special crops, such as sugar, sugar beets, honey, maple products, flax, fruit, vegetables and tobacco. In short, no branch of agriculture is overlooked. The nutritive and commercial values of different foods are set forth in company with a deal of excellent advice on the practice and results of thrift. Marketing is dealt with, and sections of the book are devoted among other subjects to Economy in the Home, Patriotic Purchasing, Women and the War, the Call to the Colours, Patriotic Relief Work, and Education and the War.

AGRICULTURAL KNOWLEDGE AND PERMANENT AGRICULTURE

IN every community there are farmers who do not read good agricultural papers, and are indifferent to the progress that is taking place along all lines of agriculture. It is safe to say that these men are neither the best farmers nor the best citizens in the community.

There was a time when muscular effort counted for more than mental equipment in farming, but this condition no longer obtains. It is quite true that a good farmer should be healthy and with muscles hardened for strenuous work whenever occasion arises; but the modern farmer should possess in addition to good health and hard muscles a knowledge of the growing of crops and animals and a knowledge of market conditions and how best to market his products. Some farmers will dispute the matter of any need of the special knowledge referred to above. They say they have been able to grow good crops and stock and to market them quite satisfactorily, but when their net returns are examined it is found that they have sometimes been working on a narrow margin of profit, and often at a loss when the fertility of the land is taken into account. The trouble is that such farmers are poor book-keepers and do not make proper allowances for deterioration and waste. There is no disputing the fact that many farmers have made money, but they have frequently used up the fertility of the soil in doing so.

The great need of Quebec agriculture is a system of permanent agriculture whereby the fertility of the soil is conserved from year to year and from generation to generation. Such a system, however, demands a greater knowledge than most of us possess of all the factors that are concerned with agriculture. In this connection it is interesting to note that agricultural education has been the basis of the great progress of Denmark and Belgium (before the war), and is now reconstructing farming conditions in the United States. Canada has entered late upon the scene, but many agencies are already at work all having as their object the diffusion of agricultural knowledge among the rural people in order that a contented intelligent people

Geo. B. Boving, B.S.A., of the Graduating Class in Agriculture, Macdonald College, winner of the Cuteer Challenge Shield for the student taking the highest aggregate in the Cereal husbandry option. Unfortunately, Mr. Boving's face is not shown in the front page illustration.

CONTENTS

EDITORIAL:—The Circulation of the Journal. —The New Agricultural War Book.—Agricultural Knowledge and Permanent Agriculture.—Notes by the Way.—School Credit for Home Gardens and other Home Work.—Examination Results, Macdonald College School of Agriculture.

ORCHARD AND GARDEN:—Ottawa, the City of Gardens.—Insect Pests in Canada.—Some Important Questions answered on Orchard Spraying.—Cabbage Maggot and Cutworm.—Preparing Wax for Market.—Root Maggots and their Control.—Pelargoniums or Geraniums.

FARM AND FARM CROPS:—Roots.—"Fertile" Agricultural Lime Products.—Rates of Planting in Corn.—Soil Tests for Farmers.—Feeding the Soil.—The Need of Lime in the Soils of Argenteuil County.—Watch the Cutworm. — Importance of the Fanning Mill. — Six Reasons against the One-crop System.—The Benefits of Liming.

LIVE STOCK: — Ormstown Spring Show.— Ayrshire Breeders' Club at Hemmingford.— Bovine Tuberculosis and its Control.—Co-operative Sales benefitting both Buyer and Seller.—The World's Record for Breeds.—Production to Capacity.—Canada's Prospects in the World's great Beef Market.—Inoculation for Stock Diseases.— The Time to Act.—Poisoning hy Horse-tail.

DAIRY:—There is Money in it. A Great Cheese Year.—Milk and Pasteurisation.

POULTRY:—Preservation of Eggs.—Eggs and More Eggs.—The Poultry Raiser's Opportunity..—The World's best Layer.—New Egg-laying and Breeding Contest.—Money in Poultry.—Seasonable Poultry Notes.

WOMAN'S WORLD. — Dunham Homemakers' Club.—Foods and Food Values.—Toy Industries.

TABLE OF CONTEST.

GENERAL INTEREST:—Learn to Live on a Farm.—Letting one's self alone.—The Boy's Creed.—Measures of Farm Efficiency.

NOTICE TO SUBSCRIBERS

Subscribers and members of agricultural societies, of farmers' clubs and of the Provincial Dairymen's Association, who do not regularly receive either the English or the French Journal of Agriculture and Horticulture are requested to address their complaints to the Secretaries of their respective Societies, who will transmit them to the Secretary of the Council of Agriculture at Quebec.

may possess the land under a system of permanent agriculture.

While the practice of agriculture has made progress in recent years, it is undoubtedly true that our farmers, as a whole, are backward in accepting the teachings of the scientific experts. How many farmers, for example, are still allowing manure to accumulate in large heaps in their barnyards instead of having it hauled out and spread on the fields as fast as it comes from the stables? How do these farmers expect to get the manure on to the fields and get their crops in on time this spring? How many farmers drain their land? In a wet season, such as this one, the wisdom of farm drainage is surely very apparent.

When our farmers farm as they should do, not only will two blades of grass grow where but one grew before, but two cocks will crow where only one crowed before.

NOTES BY THE WAY

The Agricultural War Book

DR. C. C. James, Agricultural Commissioner, writes asking us to inform our readers that copies of the new Agricultural War Book for 1916 can be had by addressing (post free) the Publications Branch, Department of Agriculture, Ottawa.

* * *

Draft Geldings in Demand

The Breeders' Gazette states that a carload of grade draft geldings arrived at the Chicago horse market on Saturday April 29th. On Monday morning three of them sold for $1500 to a Chicago firm to be used in heavy hauling on the city's streets.

* * *

The Front-page Illustration

The graduates shown on Front page are:—

Back row, (Left to right):—L. W. F. Crothers, Ste. Anne de Bellevue; J. A. Ste. Marie, Compton; C. B. Hutchings, Ste. Anne de Bellevue; J. M. Hacker, North Bedeque, P.E.I.; E. S. Cochrane, Clarenceville, P.Q.; T. H. Biggar, Huntingdon, P.Q.; C. Lyster, Kirkdale, P.Q.; O. C. Hicks, Petitcodiac, N. B.; the late G. Fenoulhet, Macdonald College;

Second row, (left to right):—J. G. C. Fraser, Quebec, P. Q.; A. E. Hyndman, Sherbrooke, P. Q.; W. E. Sutton, Barnston, P. Q.; G. C. Hay, Lachute, P. Q.; J. H. McOuat, Lachute, P. Q.; J. C. Moynan, Waterloo, P. Q.;

Sitting:—R. Schafheitlin, Canning, N. S.; C. B. Gooooderham, Round Hill, N. S.

Also graduated, but not shown on photograph:— G. B. Boving, Macdonald College.

SCHOOL CREDIT FOR HOME GARDENS AND OTHER HOME WORK

NATURE Study and Elementary Agriculture are now compulsory subjects in our Quebec rural schools, and there are regular examinations and courses of study arranged for this work, with a view to emphasizing its importance. It seems necessary to have a prescribed outline of work, authorized textbooks and yearly examinations before subjects can get the necessary emphasis put upon them.

Now book work is all very well, but experience and practical participation in gardening or agricultural operations are necessary before lessons can be properly learned. So demonstration plots and experimental plots are necessary for our children if they are to benefit from class instruction and book knowledge.

The original idea was to have a school garden attached to a school. This movement for a school garden was started enthusiastically, but has frequently been dropped as suddenly as it was begun. Indeed there are several schools in the province which once had a school garden but have given up the attempt to make it a useful adjunct to the school activities. One serious defect was that the gardens were neglected in the summer vacation when they required most attention. Another was that the teacher left in June and probably the new one was not sufficiently interested to carry on the work. But whatever may have been the reason for stopping the garden, it was seen that home gardens were more successful because more accessible to the pupils at all times. It is likely, therefore, that home gardens will prove an important feature of school work and that school gardens will only be used for cooperative class work in decorating the school buildings and grounds and for demonstrating methods of planting.

But most country children have other duties to perform and are expected to help with the chores regularly, both before going to school in the morning and after returning home in the evening; some boys milk the cows, tend the poultry, pick berries or small fruits, feed the pigs, or run errands; while the girls wash the dishes, make beds, set the table and in general help the mother with the housework and lighten her burdens very appreciably.

Credit, of course, has to be given for the home work of pupils in their school gardens. This is done at the time of the school fairs or county fairs, when exhibits of the produce are judged for prizes. But it is now seen that credit will have to be given for the work done as well as for the result obtained. This question of giving credit for home garden work has raised a much larger question in the minds of educators. It suggested that any kind of work done at home might count for school credit and in some cases as much value is given to this as to any of the regular subjects. Wherever this has been tried the results have been astonishingly successful, both at school and at home.

TWO TYPES OF HOME PROJECTS

In carrying out this suggestion two schemes have been evolved, though their aim is the same and their intention is to stir interest in agricultural or domestic work of all kinds. This is real vocational training for rural children, while they are still capable of being moulded and can be supervised. In fact work done at home under school supervision is probably the only ideal we are likely to reach in our own province. Of course difficulties arose when these schemes were tried out in the United States, but these were seen to be very simple and to involve two main questions only.

First—What kinds of home work should receive credit?

Second—How should the school direct and supervise the homework chosen?

The first question led to a very broad incorporation of home projects into the schemes, and the second question resulted in two distinct plans, which take two different attitudes on the question of supervision. They may be called for the sake of convenience:

(1) The Massachusetts Plan — in which the teacher's supervision is necessary and extra study is required to supplement the work.

(2) The Oregon Plan—whereby parents merely report on the project of the children and value it themselves.

(1) THE MASSACHUSETTS PLAN

Under this plan, which originated in Massachusetts, each pupil with his teacher's advice selects some definite work to be done at home, partly under the direction and supervision of the school. The work must be such that the pupil can carry it on from beginning to end. Supplementary reading and extra study bearing on this home project is an additional part of the work. Naturally, the parent must give consent and hearty cooperation, but this is always assured and when the teacher visits the home occasionally to inspect the work, any necessary suggestions or directions are usually well received by all concerned. This is easily understood when one remembers that the home projects most successfully understaken include the raising and care of a pen of poultry; planting and cultivating part of the vegetable garden; caring for and picking fruit from part of the orchard; planting and tending berry bushes; preparing the soil, planting, cultivating and harvesting a special crop such as corn, potatoes, or tomatoes; feeding, cleaning and milking one or two cows, and testing the milk; keeping milk records and testing milk of individual cows; feeding and tending a pen of pigs; planning and building a hog or chicken house, porch or sidewalk; canning tomatoes, cherries, or other fruits; the regular performance of some piece of housework, like setting the table, serving the meals, making beds, cleaning and dusting; planning and cutting and sewing garments, and other such duties.

Wherever this plan has had a fair trial it has been very effective. Of course it means extra work for the teacher, who must visit the home occasionally. But rural teachers and rural clergymen would find this an excellent practice and should make it a regular habit. The work is not such a delicate task as might be supposed, for the tact and enthusiasm which all teachers should possess if they are to be real teachers will carry the work through to success. In Massachusetts about one half of the pupils' free time is occupied in these projects.

(2) THE OREGON PLAN

The second plan has developed more fully in Oregon than elsewhere, but is successful in many states. In this case the school does not need to supervise the home work and no extra reading is require. Children are also allowed a free choice of work, and are merely encouraged to help in regular work and do their part well and faithfully. The parents judge the amount and quality of the work, and report to the teacher who gives corresponding credit towards school ranks. Promotion to a higher grade and successful completion of the school course depend partly on proper fulfilment of this home duty. The work is often similar to the tasks mentioned in the first plan, but includes also building the morning fires, providing fuel, sawing logs and chopping wood, feeding the stock, milking the cows, cleaning the horses, caring for poultry, making the bread, sewing and ironing clothes. But any other regular work vouched for by the parent is accepted and counted as the equivalent of one school subject, which is the basis of giving credit.

In this case no attempt is made to make the work educative except in the sense that all work of any description whatever is educative if it is conscientiously and well done. The home work is not necessarily in association with school work, but the child of course receives instruction from the parent who thus resumes the function of teacher which was his before schools were invented or became common.

There has long been a divorce between the home, the school and the vocation, but none of these can get the best work done without correlation with the others. These two plans afford the most sensible way of combining the work of each and making it most effective and are the most promising field for rural industrial training. They have the supreme merit of costing no money; they do not increase the school taxes; they take little or no school time and can be started in any province and in any school at any time. They can be applied in a city school as easily as in a rural school. The teacher is shown to care for other things than intellect, for more than a mere portion of life, for the habits and tastes and future career of the child, for the whole of his life as well as for part of it. Too often no interest is taken in pupils outside of school except in the case of their games and sports. Even this is not common enough, but when it is genuinely taken, it results in increased affection for the teacher and increased attention to his teaching of school subjects. Parents are interested, for at last school is visibly doing good; children to whom book work never appeals, are at once encouraged and helped; backward boys become brighter and more active and a new interest is shown in their whole attitude to education. When promotions to a higher grade are made partly on the success of children in the activities of their home life, their home work is done with a different spirit.

It is not easy to say which plan is the better for Canadian schools. It might be objected, for example, that the Oregon plan seems to be faulty from the fact that there are too many judges and hence too many standards and that a careless, indifferent parent with an ambitious, bright child might not give sufficient credit, and that an ambitious parent might give greater credit than the lazy or careless child might deserve.

Both plans, hewever, might be very easily improved by having the pupils write about their projects and keep the accounts and records of their work. In this way composition would become a subject with real life and personal interest in it. Then if monetary values were brought into play, the financial statistics would form an excellent basis for practical arithmetic and bookkeeping.

I hope to see one of these plans adopted with modifications in Macdonald College Day School and spread to all our rural schools and academies in the Province of Quebec.

SINCLAIR LAND

SCHOOL OF AGRICULTURE, MACDONALD COLLEGE

Examination Results for the year 1915-16

FIRST YEAR:—The following students have completed the first year work and are eligible to enter the 2nd Year:—

General Proficiency. (Names in order of merit.)

Class I. None.
II. Sutherland, J. D. 4330 St. Catherine St., Westmount, Q.
Bourne, B. E., The Chateau Fontabelle, Barbados, B.W.I.
Wright, E. S., c/o Mr. James Stevens, Windsor, Que.
Kingsland, W.R., 27 Roseberry Ave., Ottawa, Ont.
Smith, C. H., 79 Davis St., Rutland, Vt., U.S.A.
x Maw, W.A., Ormstown, Que.
Dogherty, F. W. 290 Boulevard St. Joseph W., Montreal, Q.
Ashton, W.E., Waterloo, Q.
III. x Adams, J., Hampton, N. B.
x Phaneuf, R.J.A., St. Antoine de Vercheres, Que.
x Butler, J.H., R.F.D. No. 1, Lennoxville, Que.
Nesbitt, H., Winchester, Ont.
Laurie, D.M., 398 Melrose Ave., Montreal, Q.
xx Boyce, C.E., Athelstan, Que.
Patenall, D., 241 Addington Ave., Notre-Dame de Grace, Q.
xx Singer, M., 833 Cadieux Street, Montreal, Q.
xx Pesner, A. N., 55 Guilbault St., Montreal, Q.
x Kutzman, N., 1557 St. Lawrence Boulevard, Montreal, Q.
xx Barnett, W.H., Shawville, Q.
x Levine, L., Ste. Agathe des Monts, Que.
xx Welsh, J. N., Kingsmere, Q.
xx Hyde, C.J., Huntingdon, Que.

Aegrotat:—

Graham, J. W., Brysonville, Que.
x Little, H.W., Kinnear's Mills, Que.

Enlisted—Granted Year:—

Rey, A. M., c/o Principal E. H. Brandt, Pointe-aux-Trembles, Near Montreal, Q.

"x" (or asterisk) indicates supplemental examination required in one subject.

2nd YEAR:—

The following students have completed their second year and are entitled to the diploma given by Macdonald College for the two-year course in agriculture.

General Proficiency. (Names in order of merit.)

Class
I. Newton, Miss Margaret, Plaisance, Que.
Birks. Hobart M., 715 Pine Ave., Montreal, Q.
II. Tilden, S. F., 67 Rosemount Ave., Westmount, Q.
Cameron, S.Y., Adamsville, Q.
Arnold, G. E., Grenville, Q.
Jones, W. N., 80 Somerville Ave., Westmount, Q.
Matthews, G. D., Macdonald College, P. Q.
III. Hawke, L. C., Ste. Anne de Bellevue, Q.
x Norcross, A.C., Lennoxville, Q.
xx Holden, E.W., Frelighsburg, Q.
Macfarlane, I.P., Huntingdon, Q.
xx Reid, E.G.B., Hemmingford, Q.
x Derick, R.A., Clarenceville, Q.
xx Holmes, W.B., R.R. No. 1, Ayer's Cliff, Que.
xx Todd, R.H.D., R.R. No. 2, Lachute, Que.
xx Smiley, V.C., R.R. No. 2, Shawville, Q.
x Buckland, A. J. B. Coaticook, Q.
xx Robinson, F., Duclos P.O., Que.
xx Reid, R.J.M., Chateauguay Basin, Q.

Unranked:—

x Mace, H.S., 39 Nichols St., Rutland, Vt., U.S.A.

Aegrotat:—

Hodge, R.G., Cookshire, Que.

FOURTH YEAR:—

The following students have completed their fourth year and have been granted the degree of Bachelor of Science in Agriculture by McGill University. (Names in alphabetical order.)

Biggar, Thomas Howard, Huntingdon, Que.
Boving, George Bror, Macdonald College, P.Q.
Cochrane, Edward Stanley, Clarenceville, Que.
Crothers, Loring William Foreman, Ste. Anne de Bellevue, Que.
Fraser, John Gordon Carl, 10 Laval Street, Quebec, Que.
Gooderham, Charles Benjamin, c/o Nova Scotia Agricultural College, Truro, N.S.
Hacker, James MacMillan, North Bedeque, P.E.I.
Hay, George Clunie, Lachute, Que.
Hicks, Ora Campbell, Petitcodiac, N.B.
Hutchings, Clarence Basden, Ste Anne de Bellevue, Que.
Hyndman, Austin Elliott, 45, Montreal Street, Sherbrooke, Q.
Lyster, Chester, Kirkdale, Que.
McOouat, James Harold, Lachute, Que.
Moynan, John Chambers, Waterloo, Que.
Schafheitlin, Rudolf, Canning, N.S.
Ste Marie, Joseph Antonio, R.R. No. 2, Compton, Que.
Sutton, Walter Elbert, Barnston, Que.

The following are the prize-winners:—

"The John Dougall Medal":—Gooderham, Charles B.

The Sir Edward Stern Silver Challenge Cup for the student making the highest aggregate in stock judging:—Hay, George C.

The Garnet H. Cutler Challenge Shield for the student who makes the highest aggregate in the cereal husbandry option:—Boving, George B.

The $10 prize given by The Honorable The Minister of Agriculture, P.Q., for the student who makes the highest aggregate in the Horticultural option:—Schafheitlin, Rudolf.

THIRD YEAR:—

The standing of this year will be given in next issue.

THE GARDEN AND ORCHARD

OTTAWA, THE CITY OF GARDENS

"The gardener's work is one of worth,
He's partner with the sky and earth;
He's partner with the sun and rain,
And no man loses by his gain."

THIS is the title of a beautiful brochure published by the Ottawa Horticultural Society, and prepared by a Committee including R. B. Whyte, W. T. Macoun, F. E. Buck, and J. B. Spencer. It is one of the best bulletins we have seen relating to town and city improvement. A glance at the table of contents reveals the scope of the work. First, there is the making and care of lawns, then the flower garden, the vegetable garden and the small fruits garden, concluding with hardy perennials, hedges and houses plants. It will be seen, therefore, that the brochure deals with practically the whole range of horticulture, with the probable exception of large fruits.

The illustrations have been beautifully prepared, and are reproduced on paper which brings out the finest details.

This pamphlet should not be read by the city and town man only, but also by the farmer who will get a great deal of valuable information, suggestion and inspiration from a perusal of its pages.

The Ottawa Horticultural Society deserves the thanks of all garden lovers as the publication will do more for the development of a taste for the beautiful in garden-making than any bulletin that has been put forward in recent years. We therefore congratulate the Society, and especially the Committee, on the valuable work that they have accomplished.

W. L.

INSECT PESTS IN CANADA

IN the Report of the Dominion Entomologist for the year ending March 31st, 1914, which has just been published, an account is given of the activities of the Entomological Branch of the Dominion Department of Agriculture, in the matter of controlling insect pests throughout Canada and all who are interested in this subject will be repaid by a perusal of this record of a year's work. The Department now maintains nine field laboratories in different parts of the Dominion at which investigations on various insect pests are carried on. This line of work constitutes the chief aspect of the work of the Branch. A large amount of work is necessitated by the administration of the Insect and Pests Regulations of the Destructive Insect and Pest Act, involving the inspection and fumigation of trees and plants entering Canada. Perhaps one of the most interesting of the activities of the Branch is the work carried on against the Brown-tail Moth in Eastern Canada, particularly the importation and establishment of the parasites of this insect and the Gipsy Moth. A map is given showing the places in Canada where the parasites of the Brown-tail and Gipsy Moths have been distributed by the Department. Other branches of work covered by the Report are investigations on insects affecting cereals and other field crops, including an account of the notorious Army-worm outbreak of 1913; insects affecting fruit crops, as the result of which investigation work of great practical value has ensued; insects affecting forest and shade trees in which an account of the investigations of Stanley Park, Vancouver, which has been so seriously affected by forest insects is given; insects affecting domestic animals and man and insects affecting garden and greenhouse. The Report is a record of marked progress in a Branch of the work of the Department of Agriculture which not only affects Agriculture, but also Forestry and Public Health. Copies of this Report may be had free on application to the Publications Branch, Department of Agriculture, Ottawa, and requests for the Report may be mailed free. All inquiries regarding insect pests should be addressed to the Dominion Entomologist, Department of Agriculture, Ottawa, and no postage is required on such letters.

SOME IMPORTANT QUESTIONS ANSWERED ON ORCHARD SPRAYING

EVER since the introduction of Bordeaux mixture, lime sulphur and arsenate of lead into orchard spraying many questions have come up which require an answer. While, in a general way, some of the more important questions have been practically settled for some years, yet there are others that have remained unanswered.

Bulletin No. 185 of the University of Illinois Agricultural Experiment Station, entitled "Field Experiments in Spraying Apple Orchards" is an attempt to answer the more important questions regarding spraying for Illinois conditions. The orchards were selected in different counties in Southern Illinois, and were typical orchards of the locality, and the spraying experiments were conducted for three or four years by the same experimenter. In this way it was hoped that results would be secured which would be of value to the orchardist.

The results of each experimenter are given in detail in the bulletin, and the summary of all results is conveniently filed at the end of the bulletin.

In answer to the question "What are the relative values of Bordeaux and lime sulphur as sprays for the apple against fungous diseases?" both were found to be excellent sprays, and where fungous diseases are known to be present, as in orchards that have been long neglected, the orchardist should use Bordeaux; otherwise lime sulphur.

"Will the addition of copper sulphate to lime sulphur increase the fungicidal value of the spray.?" The answer to this is a decided "No".

"Does arsenate of lead when added to Bordeaux or lime sulphur increase their fungicidal value?" The answer to this question was that the addition of arsenate of lead added nothing to the fungicidal value of Bordeaux, but improved the fungicidal value of lime sulphur.

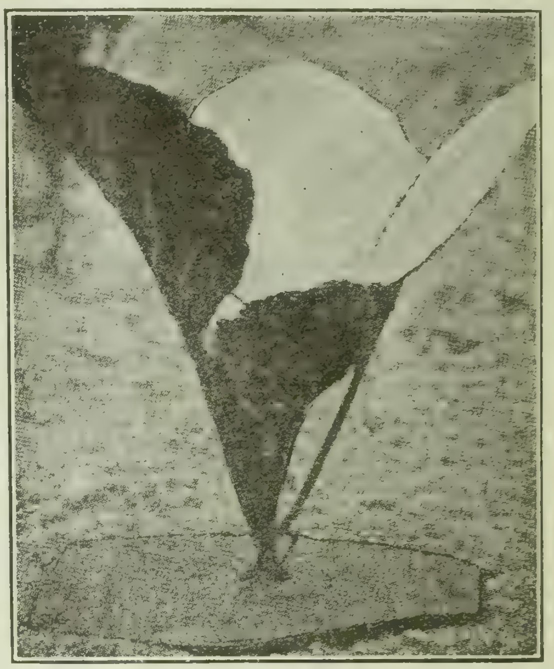
Arsenate of lead when used alone has no fungicidal value, and the various classes of arsenate of lead when used in combination with Bordeaux showed no important differences in the control of diseases, insects or injuries to the fruit.

Lime sulphur proved superior to Bordeaux in respect to spray injury to foliage and fruit. In nearly all cases the foliage on the trees sprayed with lime sulphur was more vigorous than that on Bordeaux-sprayed trees.

W. L.

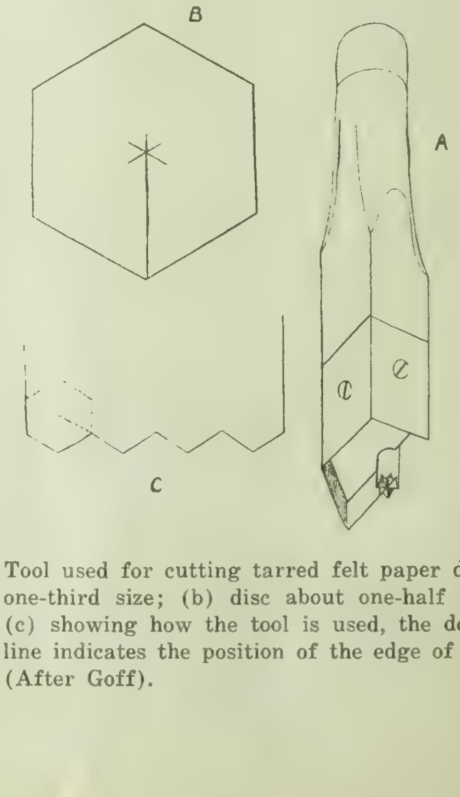
CABBAGE MAGGOT AND CUTWORMS

THE Connecticut Experiment Station, New Haven, has issued Bulletin No. 190 on "Insects Attacking Cabbage." This is a very good discussion of a number of common cabbage insects. Every year we have many letters from farmers and gardeners asking how to control cabbage root maggot. This bulletin states that the most effective control is a little disk of tarred paper put around the stem of each plant as illustrated. These paper disks may be bought from various seed dealers, or they may be cut at home with a machine such as is shown in illustration. In this case the tarred paper is spread out over a solid chunk of wood, the cutting disk put on the paper and driven in. Probably this is the most effective remedy to be used on crops of the cabbage family. Good results are also obtained by using what is known as the carbolic acid emulsion. This is made from one pound of hard soap or one quart of soft soap, one gallon of boiling water and a pint of crude carbolic acid. The soap is dissolved in the boiling water and then the acid is added and the whole thing thoroughly churned up to as to mix completely. This mixture will thicken on cooling and when used, one part of this mixture to 30 times this bulk of water will make the proper application. This is used by pouring about three ounces around the stem of each plant, making a little hole or depression in which to pour the liquid.



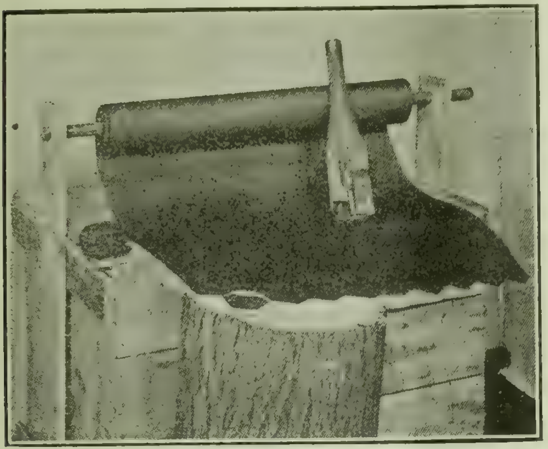
Plant Protected by Tarred Paper Disk.

Cutworms also give a great deal of trouble in some seasons. Dr. Britton, who writes this bulletin, says that the cutworms usually feed on grass, but in cultivated fields they will attack the cultivated crop. They feed at night and hide in the ground during the day. The most effective way of getting them is to give the poison bran mash made from the following formula which is used for grasshoppers in Kansas.



(a) Tool used for cutting tarred felt paper discs, one-third size; (b) disc about one-half size; (c) showing how the tool is used, the dotted line indicates the position of the edge of tool. (After Goff).

Bran mash one-half bushel; Paris green one pound; lemons three; molasses two quarts; water 3½ gallons.



Simple method of mounting a roll of tarred felt paper, when a large number of discs are required. (From 14th Report of the State Entomologist of Connecticut).

Mix the paris green (dry) with the bran thoroughly. Squeeze the juice of the lemons into the water and cut up pulp and rind into fine pieces and mix together. Then pour in the molasses and stir. This mixture is then added slowly to the poisoned bran mash and when complete is rather dry and easy to handle. This should be applied by scattering it broadcast in the late afternoon, if possible before the plants are set, so that it will be moist when the "worms" start to feed in the early evening.

Early Spring plowing and harrowing will help to destroy these insects, and of course where above method is used care must be taken to keep it away from the poultry.

PREPARING WAX FOR MARKET

THE most valuable by-product of our apiaries is beeswax. With a market value of nearly two cents per ounce it behooves us to look after all the small bits of comb and wax scrapings that accumulate from the hives and render them into marketable shape. The extracted honey producer is of course the one which has the most wax to dispose of on account of the cappings taken from the extracting combs. The item is not to be overlooked in the case of the comb honey producer who has the opportunity of collecting bits of burr and brace combs. There are various ways of preparing such bits of wax for market. For the small bits of wax that are always being gathered up a solar wax extractor is a very handy and convenient machine. This does nicely for cappings also, which are practically all wax. A solar wax extractor, which uses the heat of the sun to melt the wax, is not powerful enough to thoroughly cleanse the wax from the brood combs. For this purpose it is necessary to employ some kind of hot water press. The best form of press on the market and one which extracts the wax most economically consists of a strongly constructed screw press operating in a can. This can contains the wax to be rendered. Previous to being put in the can the combs have been boiled in a separate vessel with soft water until they are of a soft pulpy consistency. This mass is ladled from the heating vessel into the can of the press. In putting it into the can the mixture of combs and boiling water is poured into pieces of cheese cloth which are loosely wrapped about the mass. The pressing can is supplied with slatted dividers, these dividers are put between each cheesecloth package of combs. When the can is full the screw press is turned down and the wax squeezed out and floats to the surface of the water and runs off through a small spillway at the top of the can. Pressure is relaxed to allow the hot water to saturate the mass of combs again and pressure is again applied. After going through this operation the wax will be in the form of cakes more or less dirty and sticky. To turn out a finished product fill a vessel partly full of soft water, heat the water to a temperature of about 160 deg. F. and after having broken up the cakes of wax into pieces of about five inches dimension put them into the water and stir until all is melted, then cover the vessel over in such a way as to retain the heat and set the whole aside to cool gradually. When the wax has cooled remove the cake from the vessel, scrape off the residue on the bottom and the beeswax will be a clean, clear yellow.

There are various ways of shipping wax in boxes, barrels, bags and so forth. Boxes and barrels have a certain considerable weight of their own which help to increase the transportation charge. Boxes are proned to crack and break open unless firmly nailed and unless all the small openings are carefully closed up will let small pieces of wax escape in transit. Double thickness of bags tightly tied up is the cheapest and about the best method of preparing for shipment. The shipper of course should always be careful to enclose his name inside the package whether on the outside or not.

HARRY W. JONES,

Bedford, Que.

ROOT MAGGOTS AND THEIR CONTROL

AMONG the insects which attack vegetable plants, the root maggots every year destroy many thousands of dollars, worth of such crops as cabbages, cauliflowers, turnips, radishes, onions, beans, corn, etc. Those insects are widespread throughout Canada occurring in all of the provinces. The Entomological Branch of the Department of Agriculture has just issued Bulletin No. 12 entitled "The Cabbage Root Maggot and Its Control in Canada, with notes on the Imported Onion Maggot and the Seed-Corn Maggot." This has been written by Mr. Arthur Gibson, Chief Assistant Entomologist, in Charge of Field Crop Insect Investigations, and Mr. R. C. Treherne, Field Officer in charge of the Entomological Laboratory at Agassiz, B. C., as a result of a number of years of work conducted in the provinces of Ontario and British Columbia. The bulletin comprises 58 pages, 29 illustrations, and a valuable chart showing the egg deposition of the Cabbage Maggot Fly during a single season. Following a brief introductory and historical note the Cabbage Root Maggot is treated in detail. The various stages of the insect are described and figured and the life-history, development, habits, etc., fully given.

Notes on the life-history, habits, etc., of the Imported Onion Maggot and the Seed-Corn Maggot then follow.

The means of controlling root maggots are discussed at considerable length, as for instance felt tarred paper discs for cabbages and cauliflowers, cheese-cloth frames, trap crops, autumn planting, poisoned baits to destroy the adult flies, etc. Cultural control and natural control are also discussed, under the latter chapter interesting information being given on predaceous and parasitic insect enemies.

Owing to the decided economic importance of root maggots, farmers should make early application for this valuable bulletin. Any farmer may obtain a copy free of charge on application to the Chief, Publications Branch, Department of Agriculture, Ottawa. Enquiries concerning injurious insects and remedies therefor should be addressed to the "The Dominion Entomologist, Department of Agriculture, Ottawa". To this latter officer, packages up to 11 ounces containing insects and their work may sent free of postage.

PELARGONIUMS OR GERANIUMS

THE Pelargonium family is a very large one, with many different varieties, and is an excellent house plant. Pelargonium, or Royal George, is a spring blooming plant, and should now be looking its best, but unless the plants are given proper treatment during the summer good results cannot be expected. After the blooming season is over they should be placed outside in a shady position, and the water gradually withheld in order to ripen the plant. After the wood is ripe, which will be about the first week in August, the plants may be cut down, leaving two or three eyes on each stem, the old soil shaken from the roots, and then repotted into small pots. Place them in a frame or a good sunny window, water sparingly, and directly the plants have made a little growth and the pot is filled with roots, give them larger pots, using pots in proportion to the size of the plants. The final potting should take place about November. It is very necessary to give the plants all the light possible, as they make very little growth during the winter months. Great care must be exercised in watering; keep the soil moist, increasing the supply as the plants begin to grow.

A fine display of Maiden-hair ferns and Calceolarias.

A fine selection of Pelargoniums.

Directly the buds begin to appear a little stimulant should be given; this will help to produce good foliage and flowers.

The Geranium

The Zonal Pelargonium, or Geranium, is a very desirable house plant, and will bloom all winter if given proper treatment. The semi-double variety is a most brilliant winter-flowering plant, and is of all shades of scarlet, crimson, carmine and the purest white.

Geraniums that have been blooming all winter should now be given a short rest by withholding the water for a few weeks, but they should not be allowed to become dust dry. This treatment will allow the wood to ripen. The plants may then be cut back, leaving two or three eyes on each stem, and the water may be given sparingly. Directly the plants have made a little growth shake the soil from the roots and pot them into suitable pots. Never allow the soil to dry out. During the summer growth all flower buds should be taken off and the ends of stems pinched out; this treatment will encourage branching out, and the result will be good bushy plants.

Propagation

To ensure an abundant crop of flowers during the winter months cuttings should be taken now. Select good strong growth that was made the previous year; place the cuttings in 3" pots, using a sandy soil, keep it moist but not too wet. The cuttings should be placed in a shady window, or better still in a small frame. As soon as the pots are filled with roots repot into larger pots, using a good rich soil. Six or seven inch pots are sufficiently large to carry them through the winter.

Pelargoniums are propagated in exactly the same manner, but cuttings should be taken in August. They will also grow from seed, which should be sown at once.

E. H. JONES

THE FARM AND FARM CROPS

ROOTS

Mangels or Swedes.—Some pointers for seeding

THERE has been a general tendency within recent years throughout the country to grow mangels instead of swedes. This, in a way, is a good sign because it indicates progression. The man who makes a success of mangel growing knows something about farming. You can grow some other crops in a haphazard way, you may even get a reasonable crop of swedes or turnips by slipshod methods, but you can not get mangels that way.

At the same time it may be questionable if it is advisable to make the change so complete as some men seem inclined to do. While it must be admitted that mangels, on good land and in favourable seasons, outyield swedes in southern Ontario and western Quebec generally, it should be clearly understood that these two ideal conditions, good soil and favourable seasons, do not by any means occur always and everywhere. And just here I should like to emphasize that mangels require a deep, rich soil in good heart. They can not, as a rule, compete with swedes or turnips on weak land, even if this has had a heavy dressing of farmyard manure with a liberal supplement of commercial fertilizers. Mangels give too small a yield after cold and rainy summers, while swedes are not unfavourably influenced by a cool and wet season. Again, a warm and dry period very often sets back the swedes through subsequent attacks from aphis and mildew. On the other hand—if the heat and drought are not too severe mangels suffer comparatively little, at least on deep soils. We see thus that these two kinds of roots complement each other in more than one way.

Under ordinary circumstances it might therefore be advisable to grow both kinds, mangels and swedes, even if preference should be given to the one or the other. On a good mangel farm I would thus plant one third to one fourth of the root area with swedes, and if my land were not in such a high state of culture as to produce mangels to perfection I would make swedes my main crop, but still reserve a piece of my root land for mangels. This arrangement would tend to equalize to some extent the influence of seasonal differences on the total root crop. And in view of the fact that mangels, on the whole, are better keepers than swedes, it would also provide roots for a longer feeding period.

While it may be at least relatively easy to decide in regard to kind, i.e., whether preference should be given to mangels or swedes in each particular case, it is decidedly difficult to choose in regard to variety. Among the mangels at present offered on the market we find, as a rule, the best varieties in the intermediate class. If now, for instance, different lots of "Yellow Intermediate Mangels" were identical, when bought under this name from different seedsmen, there would be no difficulty in obtaining good seed. Such, however, is not the case. One can pick out at least four distinct types of mangels offered at present under the name of "Yellow Intermediate". I would advise those who have not already bought their supply of mangel seed to ask for "Danish Sludstrup" as being one of the best strains of "Yellow Intermediate" on the Canadian market. Where the soil is too shallow or too heavy for the intermediate mangel, the globe shaped or the cylindrical type should be preferred, as represented by the "Yellow Globe" and "Ideal or Yellow Eckendorfer" respectively.

Available swede seed seems to be more reliable than the mangel seed, and several good varieties may be obtained from the dealers. But real strains are scarce just as in the case of mangels. Broadly speaking the globe shaped swede types are better bred than the tankard shaped, and for myself I prefer such varieties as "Magnum Bonum", "Hall's Westbury" and "Bangholm" to the ordinary quality of "Elephant", "Kangaroo" and other tankard swedes.

"It is never too late", is a good and comforting phrase. Nevertheless, one should be very careful in the application of it at least in regard to preparation of land and dates of seeding for roots. It is too late now to create absolutely first class soil conditions where part of the work has not already been done, through double ploughing and topworking between ploughings last fall. But we can still do the next best thing, that is give the root land a good spring cultivation. In all spring operations we ought to bear in mind the necessity of preserving the winter moisture. The soil should, if possible, always be "closed up" with a spike tooth harrow or some other smoothening implement after plowing, discing or cultivating.

Strawy manure should not be used in spring time as the straw tends to dry out the land and is apt to clog the tools during summer operations. It has also been claimed by some investigators that strawy manure, used in large quantities, favours the activity of denitrifying bacteria and that it may on this account reduce the fertility of the soil. If the land has not been, or can not be, supplied with sufficient quantities of well-rotted stable manure, commercial fertilizers may be advantageously employed. It can almost be taken for granted that an application of nitrogenous fertilizers will prove economical in root growing. And while it is necessary to conduct a fertilizer experiment in order to determine exactly the manurial requirements of a certain soil, an addition of phosphoric acid and potash will prove beneficial in the majority of cases.

Liquid manure is the cheapest nitrogenous fertilizer we have, and it should not be allowed to remain unemployed or to flow to waste as happens on most farms. Besides nitrogen it contains a fair amount of potash, but practically no phosphoric acid. On soils deficient in this latter element an addition to liquid manure of Superphosphate or Basic Slag will therefore prove beneficial.

In the Province of Quebec we have generally had good results from the application of:—

75-100	lbs.	Nitrate of Soda
75-100	"	Sulphate of Ammonia
250-300	"	Superphosphate
75-130	"	Muriate of Potash

in addition to 15-20 tons of good barnyard manure per acre. I believe that heavier applications of fertilizers for roots would pay well on many farms, but this ought to be ascertained by accurate experiments before too much money is invested. The potash and the phosphate should be spread early in spring. The nitrogen should be distributed shortly before seeding when given in such small quantities as above mentioned. Where heavier applications are used, especially of Nitrate of Soda, it is better to apply part of the nitrogen before seeding and the rest as a top dressing at singling time.

Plant your roots as soon as the soil is in good shape to receive the seed, and remember always that it is better and cheaper to fight the weeds before rather than after seeding. Early seeding has invariably given the best results in the experiments of the Cereal Husbandry Department here. Mangels seeded on the 8th of May have on the average of three years yielded 5½ tons more roots per acre than mangels seeded on the 22nd of May, and 15½ tons more than those seeded on the 8th of June. In the case of Swedes there has been a difference of 15½ tons from seeding on the 8th of May, as compared with seeding on the 22nd of June, in favour of early seeding.

Whether seeding ought to be done on drills or on flat land is a question which caused a great deal of discussion in other root growing countries a few years ago, but it is now generally agreed that seeding on drills, or ridges, ought to be the exception, not the rule. The arguments offered in support of seeding on the flat are even more valid in Canada than in those countries with their comparatively moist summers and cheaper labour. On shallow, extremely weedy or poorly drained land seeding on drills is preferable. On deep, well drained soils flat land culture not only results in a more reliable germination and a better preservation of the moisture than it is possible to obtain in drill culture, but it will also permit the use of the weeder or tilting harrow shortly after seeding for weed killing and mulching purposes, and will thus tend to lower the cost of production.

Early seeding combined with relatively heavy seeding adds in a large measure to the attainment of a good stand, which is very essential to a good yield. People have shaken their heads when I have recommended 15 lbs. of mangel seed or 4 lbs. of swede seed per acre for average conditions with rows 25"-30" apart. I will admit that good results have been obtained with lower rates of seeding where the seed bed has been exceptionally fine, but those instances are rare and far between. On my travels during the last two summers in different parts of Eastern Canada, I have seen only five root fields in which the stand was perfect. And in the majority of the other fields the poor stand, resulting at a rough estimate in a loss of from two to fifteen tons of roots per acre, was due to insufficient quantity of seed.

Our discussion of to-day may be summed up in the following short advice: Extend mangel growing on good land only; Use good seed, plenty of it, and sow early in well prepared soil.

P. A. BOVING,

In charge of Root Crops Investigation,
Macdonald College

"FERTILE" AGRICULTURAL LIME PRODUCTS

A booklet with the above title is now being circulated, and since lime is not a fertilizer in the ordinary meaning of this word, the writer is anxious that farmers may not be misled into thinking that these so-called "Fertile Lime Products" are different from lime or ground limestone.

As a matter of fact they are made from an excellent grade of limestone, and are carefully prepared for use. They contain nothing which is not found in ordinary ground limestone, quicklime and slaked lime.

Ground limestone can now be purchased at about $3.00 per ton in carload lots f.o.b. quarry, from the Dominion Lime Company, Sherbrooke, P.Q.—H. S. HAMMOND.

RATES OF PLANTING IN CORN

Recent Discussions in Agricultural Papers

DURING the past few months there has been a great deal of discussion in the agricultural press with regard to the best rate and method of planting corn. Men in connection with the experiment stations and agricultural colleges in recent years have been advocating comparatively thin seeding to those who wish to obtain a good yield and quality of ensilage. During the past winter, however, a few growers and others have come forward who dispute the advice offered and are recommending thick planting.

A considerable amount of experimental work has been done with regard to the above question, but unfortunately it has not been done with the same object in mind, nor has it been done under conditions which coincide with our own.

The majority of experiments that have been carried on with regard to this question have been conducted where corn is grown for grain and with a view to obtaining a large yield of marketable ears rather than of ensilage. It has been conclusively proven that for this purpose three stalks per hill with the hills 3' 6" apart each way closely approximates the best rate of planting for ordinary conditions. This, however, does not necessarily mean that it is the best rate of planting for ensilage, for although the ears are by far the most valuable part of the plant, this increased yield of grain may have been produced at too great a cost of stalks or stover.

Rows 3 feet 6 ins. apart with plants 4 ins. apart. A large proportion of the ears are immature and poorly developed.

Then, too, conditions in Quebec are different from those that obtain in most other corn growing sections. Our seasons are comparatively short and it is necessary to pay a considerable amount of attention to early maturity if we wish to get the best results. This has a very material influence on the proper rate of planting, in that corn planted thickly requires more time to mature than corn planted at a moderate rate; as a result, on account of danger from frost, it has to be harvested in an immature condition and before it has reached its fullest development.

A further reason that there is a diversity of opinion with regard to this question is that different importance is placed on the various factors that go to make up the value of a corn crop. Yield is without doubt one of the most important considerations, but at the same time is apt to be most misleading. This is easily understood when one considers that in immature corn 90% of the total yield is water and 10% is dry weight, whereas in more mature corn there may be 75% of water and 25% dry weight. This means that 10 tons per acre of the latter is equal to about 25 tons of the former. Moreover, it costs money to harvest and put into the silo twenty tons of superfluous water. Most farmers can make provision for a supply of water at a smaller cost than is experienced when it is handled along with the corn crop. Obviously then, yield alone cannot be taken as a fair basis in comparing variety and cultural tests. Quality and feeding value must also be taken into consideration.

Rows 3 feet 6 ins. apart with plants 8 ins. apart. A large yield of well developed ears is produced.

In the absence of chemical analysis and of feeding experiments the actual yield of dry weight per acre represents very closely the real feeding value of a crop of corn, for although there may be some variation with regard to the digestibility and composition of the crop this variation is not great. This method represents the actual feeding value infinitely more closely than does the green yield of the crop.

From the experiments that have been so far conducted there seems to be little doubt but that corn planted thickly will give a higher yield than when planted thinly, but as we have seen the actual yield is not a reliable basis for comparison, and hence the question as to the best rate of planting still remains unanswered.

Experiments at Macdonald College

With a view to shedding light on this question an experiment was started at Macdonald College several years ago with two varieties of corn, one a flint (Longfellow) and one a dent variety (Leaming). These were planted at 3 feet and 3 feet 6 ins. apart between the rows and 4, 8, 12 and 16 ins. apart between the plants. During the first three years of this experiment the dry weight was not taken, the yield of ears, stalks, and the stage of maturity being used as the basis of comparing the relative merits of the different rates of seeding.

The result of this work showed that the largest yields of stalks were produced when the corn is four inches apart than at any other distance. The highest yield of ears, however, was produced when the plants were spaced 8 and 12 inches apart and moreover in all cases the corn was much more immature at the thick rate of planting than at the thin rate. Taking all points into consideration it was our judgment that 8" to 10" apart between the plants was the best rate of planting corn in rows.

In order to bring this question to a more definite conclusion the experiment was extended in 1915 to include rates of planting in hills at different distances apart as well as in rows, and at the same time the method of testing the yields by their dry weight as well as by their green weight was introduced. Further, the Golden Glow variety was substituted for the Leaming.

One year's work is, of course, not by any means conclusive and I hesitate to present the results, but in view of the fact that so much discussion has taken place upon which this experiment directly bears, and with which in some cases it entirely disagrees, I venture to do so.

The following table shows some of the results of this work:—

Distance between		No. of Plants	Yield in Tons per acre			
Rows	Plants		Golden Glow		Longfellow	
			Green	Dry	Green	Dry
3' 6"	4"	1	16.5	2.8	18.4	2.8
"	8"	1	15.1	3.3	13.6	3.2
"	12"	1	13.8	3.1	12.9	3.5
"	16"	1	13.0	3.0	11.7	3.2
"	3' 6"	2	11.8	2.9	12.8	3.4
"	"	3	12.9	3.2	12.1	3.1
"	"	4	14.0	3.1	12.4	3.3
"	"	5	14.4	2.9	13.2	3.0
3'	3'	2	14.0	3.6	13.5	3.9
"	"	3	15.7	3.5	13.6	3.8
"	"	4	17.4	3.5	14.4	3.7
"	"	5	16.7	3.1	14.1	3.4

This table brings out a number of important points. With few exceptions the thick rate of planting has given the highest green yield per acre; but in spite of this, in no case has it given the highest dry weight. Obviously the dry and the green weights are not closely associated with one another. As it has been already pointed out that the dry weight represents much more closely the actual feeding value than does the green weight, as far as this experiment goes the thickest planting does not give the best results. When corn is planted in rows it would seem that eight to twelve inches apart would be the best distance. When planted in hills at three feet or three and one half feet apart, two and three stalks per hill have given rather better results than thicker planting. These results go uniformly to show that thick planting is conducive to late maturity, to a high percentage of moisture, and to a low yield per acre when the dry weight is considered.

Hills 3 feet 6 ins. apart each way 3 stalks per hill. A large yield of well developed ears and few nubbins.

The following table shows the results of that part of the work that has been carried on for four years. An additional column has been added which contains the dry weight. This has been calculated from the green weight on the basis of percent dry to green in 1915. This percentage is based on only one year's work and for that reason the figures in the last column are indicative rather than conclusive.

		Yield per acre in Tons	
		Green	Dry
Rows	Maturity of ears (2 yrs)	Fodder	Fodder
LONGFELLOW			
3' 6" apart			
Plants 4" apart	75	16.5	3.7
8" apart	84	14.7	3.5
12" apart	87	14.0	3.9
16" apart	87	12.	3.4
Rows			
LEAMING			
3' apart			
Plants 4" apart	64	18.2	3.1
8" apart	70	17.4	3.2
12" apart	76	19.7	4.1
16" apart	74	16.6	3.9
Rows			
3' 6" apart			
Plants 4" apart	65	18.4	3.1
8" apart	76	15.9	3.5
12" apart	77	15.6	3.6
16" apart	77	14.0	3.3

It will be observed that the four years test does not differ materially from the 1915 work as regards the relative green yield from the different rates of seeding. If we consider the percent dry to green in 1915 as approximately correct it will be seen again that in no case has the thick seeding given as good results as the thinner rates.

General Conclusions

While the above results are not as yet conclusive in that they have not been conducted for a sufficient length of time (especially in hill planting), as far as they go they indicate that for our conditions comparatively thin planting is to be preferred to thick planting.

Apart from the actual feeding value of a crop the keeping quality and its palatability are important considerations. When corn is harvested in an immature condition a large amount of acid is formed and consequently we have a sour ensilage of poor quality. The best ensilage is made when the ars are well ontowards the glazing stage, a point which is not reached readily where corn is planted abnormally thickly.

Hills 3 feet 6 ins. apart each way 5 plants per hill. A larger proportion of nubbins produced than in the thinner planting.

Taking all things into consideration corn planted sufficiently thickly to ensure one plant every 8 or 10 inches in rows 3 feet to 3 feet 6 inches apart, or three to four plants in hills 3 feet to 3 feet 6 inches apart each way, will very closely approximate the best rate of planting. Either can be depended on to give a high yield of corn of good quality under proper soil preparation and management. In actual practice it is necessary to seed considerably more thickly than the required amount on account of the impossibility of obtaining a perfect germination and of securing a uniform drop form the corn planter. With uniform seed of high quality less seed will be required than if the seed is of an inferior quality. As a rule under good conditions of soil and with good seed it is necessary to plant at least five kernels per hill to ensure a stand of three plants per hill. It is better, however, in all cases to err on the safe side, that is, by planting rather thickly and then if necessary thin to the proper rate when a good stand is established.

Whether corn should be planted in hills or in rows is still an open question, and one which depends largely upon local conditions. It is generally understood that a higher yield is obtained when planted in rows, but on the other hand it is recognized that a higher yield of more mature ears is produced on corn planted in hills. Taking both these points into consideration it is doubtful if either method has any material advantage over the other as far as the feeding value of the crop produced is concerned.

Although hill planting requires a little more work in preparing the land for seeding, it has a decided advantage over row planting in that it allows of cultivation in two directions, and as a result weeds can be controlled with a minimum of hand labor; moreover, the extra cultivation makes the soil in better condition for seeding down to grass and clover the following year. The hoed crop is the only place in the rotation where weeds can most easily and effectively be eradicated, and a strenuous effort should be made here to leave the land as free of weeds as possible for the other crops in the rotation. For this reason the hill method of planting, with cultivation in both directions, should be the common method of handling the corn crop where, as is usually the case, weeds are an important consideration. If this method were followed more generally, and thorough cultivation given through the summer, it would go a long way towards freeing Quebec farms of many of the weeds that they now have.

R. SUMMERBY,
Macdonald College

SOIL TESTS FOR FARMERS

SOURNESS or acidity in soils, so prejudicial to maximum yields in most farm crops, has been found to be prevalent in many parts of Quebec. This unfavorable condition is easily remedied by the application of ground limestone, slaked lime, or wood ashes.

From a casual examination of soil it is impossible to detect the degree of sourness; this can be done only in a chemical laboratory.

So important is this question of soil sourness that the Chemical Department of Macdonald College has undertaken to make the necessary tests for farmers who are interested. Samples of about one quart representing the top 6 inches of soil may be sent by mail accompanied by the following data:

1. Name and address of sender.
2. Treatment in regard to manure and fertilizers for two years previous.
3. The prevalence or otherwise of sorrel.

No charge will be made for the work of examining and reporting on the samples.

FEEDING THE SOIL

Points Considered in Selecting Fertilizers

MUCH has been written on the subject of feeding the soil during the last few years, but few of the articles appear to show any real comprehension of the business and the practical side of the question. The calculation of the value of a mixed manure by the units of nitrogen or phosphate it contains is only one side of the matter, and is really of quite secondary importance. The main question for the farmer to consider first of all is not the cost per unit of the ingredients of the manure, but the value of the nitrogen and phosphate to him as a farmer growing crops for a living. What increase is he likely to get in his crops for the use of so much super or basic slag or sulphate of ammonia, or from the use of four hundred pounds an acre of some special manure? It is going to pay him in the increased crop? Is the phosphate necessary at all, or can we do without the nitrogen? If either or both are unnecessary, or are not likely to give a paying increase in the crop, of what consequence is their unit value?

First Considerations

These points are, in the writer's opinion, of the utmost importance; they are indeed the foundation of the whole art of manuring, and it is only after they have been well thought out that any question of unit values comes in. The farmer must consider carefully first, whether it will pay him to use manures at all; then if he comes to the conclusion that it will, he must make up his mind whether it is phosphates, nitrogen, potash, or any combination of these that his soil and crops require, and having done this, the consideration of the unit values of the different forms of phosphates, nitrogen and potash may then be undertaken. Tens of thousands of dollars are thrown away every year by the use of unnecessary and unsuitable manures, or by omitting one of the ingredients that is necessary to enable the others to work to the best advantage. This latter is a very much more common source of loss than is generaly supposed, though money is also commonly wasted in buying manures containing unnecessary ingredients.

Careful Use

On many clay soils, for example, nitrogenous manures applied to grain crops, without the use of phosphates in addition, fail to produce any remunerative increase in the yield of grain, though they may grow more straw. It is even quite possible for a considerable dressing of nitrogenous manure under these circumstances to depress the yield, whereas, had phosphates been applied as well, there would have been a considerable increase in both straw and grain. In other cases, to apply phosphates alone, without nitrogen, may produce no paying increase, while on soils in high condition from the use of farmyard manure, or from the consumption on the land of a green crop by sheep, phosphates alone may give a large increase in yield. Nitrogenous manures on a good many soils are quite unnecessary for the production of heavy crops of turnips or swedes, phosphates alone being required, while on others swedes fail to do well unless potash can be added to the phosphates. Again, there are cases where the most satisfactory crops of turnips and swedes are grown with farmyard manure, artificial manures being unnecessary, especially when phosphates are applied for some other crop.

Production and Cost

Such instances as these clearly show how important it is to know the particular manures or ingredients that are necessary for the best results in each case, and they further show how the value of any manure to the farmer may vary with the circumstances. Of what value is sulphate of ammonia or nitrate of soda to the farmer of a clay soil where its application to a grain crop is likely to result in a depression of the yield? It is worth nothing at all, unless he is prepared to apply the phosphates too, when it will possess a value. That value will be, from a practical point of view, not its cost per unit, but the value of the increase it produces. If a certain dressing produces an increase of say 5 bushels of wheat per acre, what is the value of that dressing to the farmer when wheat is seventy-five cents a bushel and what is its value when wheat is a dollar and a half a bushel. It is obviously worth practically twice as much in one case as in the other, and this important fact of the value of the increase produced, is one that must never be lost sight of when the value of a manure is being spoken of.

From what has been said it will easily be seen that there are many other considerations in valuing manures than their unit values, though the latter are of very considerable value when properly used in comparing similar manures one against the other, and in estimating the correct purchase price of mixtures. A unit is the cost of value of each 1 per cent. of a particular ingredient in 1 ton of the manure, and it is arrived at by dividing the price per ton by the percentage contained in the case of manures supplying only one ingredient. In England at the present time the prices of nitrogen and phosphates are nearly 50 per cent. higher than usual, and the farmer has to consider not only the cost, but the amount and value of the increase they are likely to produce. It may still pay him to use either nitrogen or phosphates, but on the other hand, the greatest care must be taken in determining whether either or both of these substances is required. Phosphates will in most cases pay well on grain, hay crops, and roots, where phosphates are present in sufficient quantity and the land is not in high condition.

B. C. T.

THE NEED OF LIME OF THE SOILS OF ARGENTEUIL COUNTY

SOME important and interesting results have been obtained by Mr. J. H. McOuat at Macdonald College, on the lime requirements of the soils of the County of Argenteuil. Over eighty different agricultural soils were examined, and of this number, seventy-eight were found to require the addition of lime or limestone to render them sweet; two of the soils contained sufficient lime and one was found which, though not in need of lime, would probably derive some benefit from its application.

It is probable that other counties of the province are equally in need of lime to overcome their sourness.

Farmers who are interested in this most important question of soil sourness, may have their soils tested, if samples of about one quart are mailed to the Chemistry Department of Macdonald College. A report will then be sent to them advising the necessary quantity of lime or limestone to apply.

H. S. HAMMOND

WATCH THE CUTWORMS

THERE have been many complaints recently concerning injuries to alfalfa, sweet clover and grain. In some instances the injury was supposed to be due to army worms, but probably in every case the insect doing the damage was the common cutworm.

This insect is particularly abundant in alfalfa and native sod during the winter and early spring. When food is not sufficient for the worms they sometimes take on a migrating habit which had led to their being considered an army worm.

The adult insect that deposits the eggs producing these worms is the familiar dark-colored moth or miller that frequents our dwellings during the months of May and June, where it accumulates upon the windows and about the lamps. The eggs are deposited by these moths almost entirely upon green vegetation, where they hatch, and the worms are usually about half grown when cold weather comes on. They then hibernate and come from their winter quarters in the early spring to attack the earliest vegetation that starts in the fields.

Remedies

Where these worms are many abundant, especially wherever they take on the migrating habit, they may be destroyed in great numbers by the use of the arsenic branmash preparation such as is used for the destruction of grasshoppers. It is prepared in the following proportions:—

Paris green	3 lbs.
Bran	50 lbs.
Cheap syrup	4 qts.
Lemons or oranges	10

Mix the Paris green and bran together while dry; dissolve the syrup in the water; squeeze the lemons into this and finely chop the peel and pulp and add them also; pour this mixture into the bran and Paris green, and stir so as to dampen the mash thoroughly. The lemons may be prepared by putting them through a meat grinder. Distribute the mixture broadcast in as fine particles as possible where the cutworms are most abundant. The application should be made toward evening or early (between 4 and 7 o'clock) in the morning. From 3 to 5 pounds of dry bran is usually sufficient for an acre of land, when used against grasshoppers. Never distribute in little piles. For cutworms, distribute more freely just ahead of the line where damage is most apparent.—*C. P. Gillet, Colorado.*

IMPORTANCE OF THE FANNING MILL

LET a farm be as clean and well cultivated as it may be and the crop grown a good one, it is still a fact that cleaning the seed will soon pay for a good cleaner. A fanning mill costs, say $30.00, a man needs to make only $1.00 an acre on thirty acres to pay for the machine.

The poorly equipped fanning mill is responsible for a lot of inferior and dirty grain being sown. Without a proper complement of screens it is impossible to do good work .

The capacity of a mill frequently gets more attention than it deserves. Efficiency is of much greater importance.

In operating, nothing is of greater importance than the air blast, as it is the scale by which is weighed the heavy and light seed. It should be strong enough to carry over the back all light grains, big or little, and not too strong to blow over much good grain. It is particularly essential that the blast be regular. If the speed is reduced even momentarily lighter grains are sure to fall where they do not belong; if too strong there will be a loss of good grain. Where gasoline or electric power is available, it will prove more satisfactory than the steadiest of man power.

For the most part hand machines are best for ordinary farm purposes. The volume of work can readily be handled by a hand machine and the additional cost of a power outfit is not warranted by the better work they do. But there is a place for the power machine in the hands of the seed centres that are springing up here and there through the country under the supervision of the C. S. G. A.—*Prof. James Murray, Macdonald College, Que.*

SIX REASONS AGAINST THE ONE-CROP SYSTEM

First:—A one-crop system is unsafe economically because it is dependent upon crop conditions and market conditions.

Second:—It does not maintain soil fertility.

Third —No permanent system of agriculture has been devised that does not include a reasonable livestock industry.

Fourth:—A one-crop system does not permit of economical farm management.

Fifth:—Under the one-crop system the returns come in but once a year.

Sixth:—The one-crop system limits knowledge and narrows citizenship.

Diversification is the biggest and most vital, the most hopeful and helpful word in the story of better farming. It is farm insurance and the beginning of farm profit and permanency. It means raising and feeding more crops on the farm, thus getting two prices and the manure from them—it means something frequently going to market and cash as frequently coming back.

A well-balanced business insures against losses and provides a much better utilization of the labour and equipment.

THE BENEFITS OF LIMING

LIME is an important factor in maintaining the fertility of certain farm soils. It is a plant food. If a soil contained no lime, plants would not thrive upon it. Although most soils contain sufficient lime for the needs of the crop, some soils become exhausted of it and it is then needed not as an indirect, but as a direct fertilizer.

Lime may benefit certain soils by improving their texture. When applied to a light, leachy soil it makes it more retentive. When applied to a clay, it has the opposite effect; the very fine soil grains are cemented together and consequently the soil is made more porous. The practical effect is that liming a sandy soil makes it less leachy, while liming a stiff clay makes it more crumbly; the condition of both is greatly improved.

A third effect of applying lime to a soil that is deficient in it, is that it makes the plant food in the soil, especially the potash, more soluble. Much of the potash in our soils is insoluble, being "locked up" in compounds with silicas. Lime attacks the silica and sets free the potash. It also prevents the loss of soluble phosphoric acid in the soil. The practical effect of this is that liming may be equivalent to fertilizing, for a time. But since lime supplies no potash, phosphoric acid, or nitrogen, the soil is eventually made less productive. This is the basis for the old adage, "Liming makes the father rich and the son poor".

The most important function of lime in modern agriculture is to sweeten sour soils. A soil that contains free acid is "sour" or acid. Such soils, though they may be rich in plant food, usually produce inferior crops; but if this acid is neutralized by adding lime, they become productive. There are thousands of acres of sour soils in the United States. The application of lime to such soils may do more to make them productive than the use of large amounts of commercial fertilizers.

Practically all farm crops, except watermelon, Hungarian grass, red-top, blackberries, and the lupines, do poorly on a sour soil; these seem to prefer it. Indian corn and rye stand it much better than the other cereals. Clover, alfalfa, beets and timothy are almost sure to fail on sour soils.—*S. W. Fletcher's Soils.*

Overland
TRADE MARK REG.

$850

Roadster $825
Model 75 - f.o.b. Toronto.

Time flies
—waiting is wasting

You who have waited—why?

Are you one of those who wouldn't get a car until you could get a real **one**—without paying too dear a price?

Your wait is over—here is a real automobile—every inch an Overland — for $850

Have you been waiting for a small car which you could own without apology for its appearance?

Wait no more—the $850 Overland is a beauty.
Do you wait for a small car, which is roomy, comfortable and easy riding?

No need to wait longer—the $850 Overland proves that comfort does not depend upon size.

Almost everyone with automobile experience has realized the many advantages of the small car.

Men who own both large and small cars use the small one constantly—drive the large one only on occasion.

But until now small cars have been only a convenience —a utility—lacking in appearance, comforts and equipment.

The $850 Overland has changed all that—

It has the small car advantages—the big advantages of economy—the delightful advantages of ease of control and small turning radius.

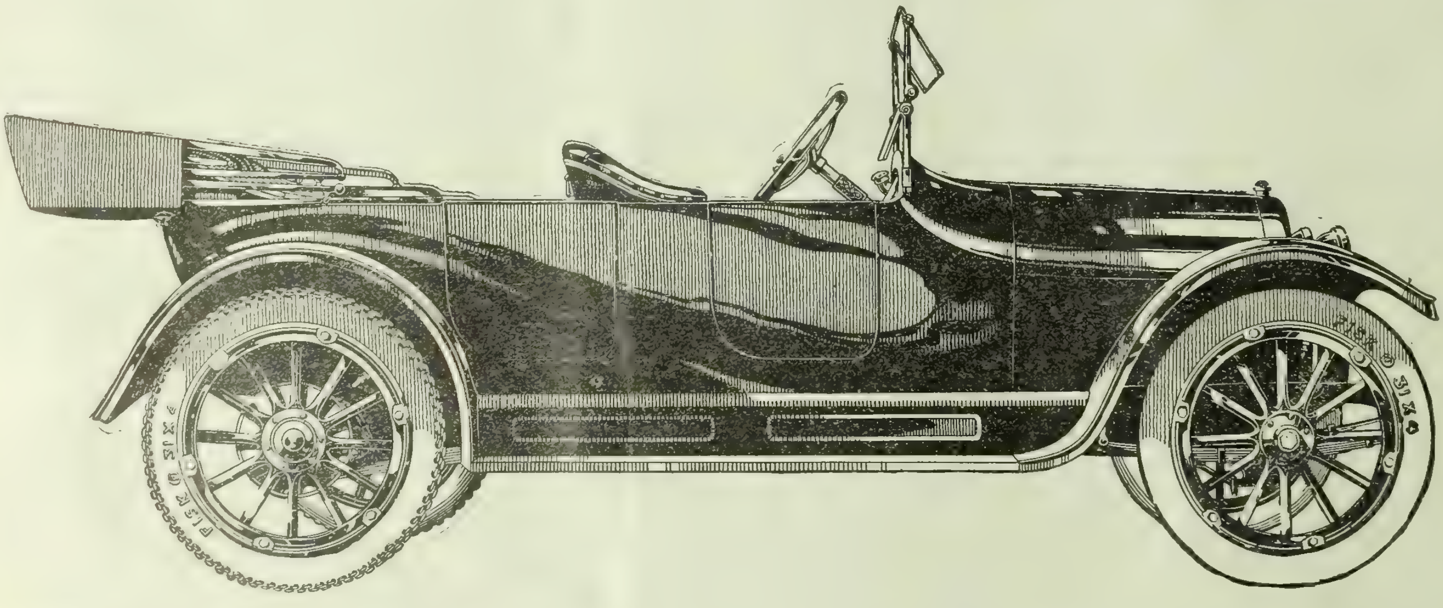
But it also has the advantages heretofore found only in the larger, more expensive cars—beauty—finish—style —comfort—every convenience of complete equipment.

Nothing is lacking—not even the thrill of speed and abundant power.

Catalog on request. Please address Dept. 659

Willys - Overland, Limited

Head Office and Works, West Toronto, Canada



Cheer up —get this Overland

People who have never driven a car—

People who have driven small cars—with apology and discomfort—

People who have driven the larger, more expensive cars—and counted the cost—

People with no experience — people with much experience—people of small means—people of wealth—all find this $850 Overland their ideal automobile.

That's why it has swept the continent like a prairie fire—taxing to the utmost our enormous capacity which is easily double that of any other producer of cars of like size and class.

No need longer to ask "Can I afford a car?"

The price of this Overland is $850 and it is absolutely complete to the last detail—there is not a single extra to buy.

And it is the last word in upkeep and operating economy.

No need longer to ask "Will I be satisfied with a small economical car?"

You will drive the $850 Overland with pride in any company — on any occasion.

You will be proud of its appearance.

The comfortable roominess and its easy riding qualities will be another source of pride.

Its power and speed, and all round performance, will give you thrills which more than anything else arouse the owner's pride in his car.

So here's what you've waited for, there's nothing left to ask.

There's just one thing left to do.

See the Overland dealer—have him show you the car and demonstrate it.

Then place your order without delay for the buying is already heavy and there is a limit even to Overland production capacity.

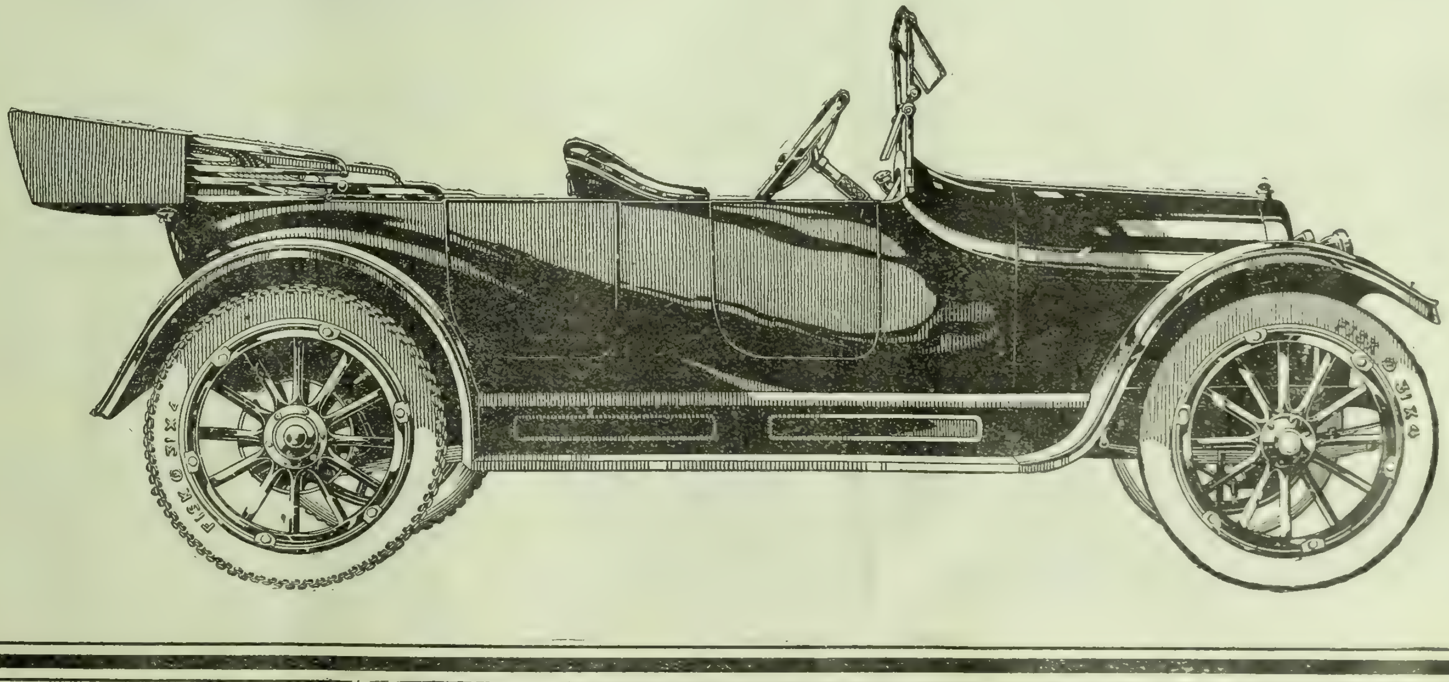
Catalog on request. Please address Dept. 659

Willys-Overland, Limited
Head Office and Works, West Toronto, Canada.

Overland
TRADE MARK REG.

$850

Roadster $825
Model 75 – f.o.b. Toronto.



LIVE STOCK

ORMSTOWN SPRING SHOW

THE Directors of the Ormstown Spring Show have let contracts for five new cattle sheds, four horse barns and one sheep and swine building, all to the completed for the coming Show to be held on June 7-8-9, 1916.

The Judges appointed by the Government for this Show are: — Heavy Horses, Wm. Graham, Claremont; Light Horses, Dr. J. A. Sinclair, Cannington, Ont.; Ayrshire Cattle, Alfred Kains, Byron, Ont.; Holsteins, F. R. Mallory, Frankford, Ont.; Jerseys, Shorthorns and Swine, Prof. E. S. Archibald, Ottawa, Ont.; Sheep, John Miller, Ashburn, Ont.; Poultry, W. H. Reed, Kingston, Ont.

With more and better accomodation for stock and an increase of $2500.00 in the Prize List the Directors are preparing for the largest and best Spring Show ever held in Ormstown. The Prize Lists are now out and can be had by writting the Secretary, W. G. McGerrigle, Ormstown, Que.

AYRSHIRE BREEDERS' CLUB AT HEMMINGFORD

THE Secretary of the Canadian Ayrshire Breeders' Association, W. F. Stephen of Huntingdon, Que., met the Ayrshire breeders in the east end of the County of Huntingdon at Hemmingford and organized the Hemmingford Ayrshire Breeders' Club.

Quite a large number of breeders were present to whom Secretary Stephen explained that the object of the Clubs was to promote good followship among the breeders and the general interests of the Ayrshire breed of cattle; to hold meetings to discuss the best methods of breeding, rearing, exhibiting and raising the standard of excellence of the breed; to encourage the entry of cows and heifers in the Record of Performance test, to hold public sales, and to bring before the public the good qualities and exceptional merits of the Ayrshire breed.

Those present decided to organize and a Constitution was adopted. The Ayrshire is peculiarly adapted to this section of country where there are already a number of fine Ayrshire herds. It is expected that this Club will shortly have in the vicinity of fifty members from the east end of the County of Huntingdon and the adjoining counties of St. Johns and Napierville.

The following officers were elected:—

Hon. President—Arch. Cleland, Hemmingford, Que.;

Hon. Vice-President—Geo. Bustard, Hemmingford, Que.;

Vice-President—Geo. W. Bustard, Franklin Centre, Que.

Secretary-Treasurer—Fred Sweet, Hemmingford, Que.

Auditor—R. W. Blair, Hemmingford, Que.

Directors: — R. T. Brownlee, Hemmingford, Que.
J. C. McKay, Hemmingford, Que.
Thos. A. Stewart, Hemmingford, Que.
W. B. Stewart, Hemmingford, Que.
Donald Watt, Lacolle, Que.

This is the third Club organized by Secretary Stephen within the past two months.

BOVINE TUBERCULOSIS AND ITS CONTROL

TO outline definite directions for the prevention of the disastrous disease of tuberculosis is no easy task.

It is apparent that no progress can be made in the exceedingly difficult task of enforcing preventive measures without an intelligent public interest, confidence and support. Therefore organized efforts along educational lines are the first steps to be considered.

We regard tuberculosis as one of the greatest questions before the public at the present time. The disease has been prevalent for many years, causing our country great losses which are shown chiefly among our producing animals.

In view of the high cost of living such an enormous loss of a valuable food product, together with the danger of the disease being transmitted to the human family, compel us to regard the question seriously.

The main problem at this time is to control the disease. With the progress now being made in science and practice it may be expected that the question of eradication will come up later, but unquestionably the matter of control will be uppermost for years to come.

For success the first requirement is an honest purpose to co-operate between all the interests involved, especially the progressive farmer, Veterinarian and packer.

Bovine tuberculosis is a specific infectious disease caused by the bacteria of tuberculosis multiplying in the organs of living animals. It is spread from animal to animal in the herd by the bacteria escaping from the infected individuals through the discharge from broken-down tubercular nodules. These escape from the lungs or glands in the throat and are spread by the saliva or droolings from the mouth. They also escape from the intestinal tract in the manure and often in the urine and milk.

The Live Stock Building at Ormstown when the Great Shows are held.

One of the most prolific means of disseminating the disease in a dairy herd is the infection of calves by milk from tubercular cows, while if the milk had been sterilized by boiling 10 minutes the danger of infection would have been removed.

Tuberculosis cannot positively be detected in cattle by physical examination except in advanced cases, or when the disease manifests itself in certain organs as the udder or in the glands of the neck, shoulder and flank. But it can be diagnosed by the tuberculin test. This test makes it possible to detect affected animals before the disease is far advanced, or the animal has much chance of spreading the disease and while its flesh may still be fit for food.

It would surprise us somewhat if we knew how many cows in the province were suffering from tuberculosis. Unfortunately there are no reliable statistics on which we can base a percentage statement. We know, however, how fearful have been its inroads in a large number of herds. It is also true that there are many herds into which the disease has not gained access because of the care of the owner, or due to the laws of chance. With tuberculosis wide spread at home and abroad there is great need of special care in the purchase of animals.

The control and possible eradication of tuberculosis will depend largely upon educating farmers as to the extreme importance of sanitary observations, and of the great danger of an infected animal to the remainder of the herd. Also the possibility of the disease being transmitted to the human family.

All dairy or producing animals should be tested by the tuberculin test at least once a year by either the subcutaneous or intradermal method, both of which are reliable, and any animal reacting should be disposed of as soon as possible.

A number of people believe that much could be accomplished were the Federal or Provincial authorities to take more stringent means in regard to the control and eradication of this disease. Apparently in the opinion of the authorities it has not yet seemed possible to devise a workable plan which would be more effective than the present inadequate provisions. The loss occasioned by this disease is great. Not only are cattle lost by it, but the affected animals do not give the same returns for the feed they are given, a certain amount being required to sustain the parasite, and this in itself is a real loss to the owner.

Again we have the hog which may become affected by drinking milk from a creamery or cheese-factory in a vicinity where tuberculosis is prevalent.

Also consider the packer. He is obliged to take chances on the carcase being condemned by federal authorities and they have to pay for animals or parts of them that are rendered unfit for food by the ravages of this disease.

Now let us consider briefly the danger of transmitting the disease to the human family by infected milk.

We know without doubt that a calf from a tubercular cow is liable to contract the disease, if it is allowed to use the mother's milk, and if the same milk is sterilized it can be given to the calf with but little danger.

We also know that hogs can contract the disease by being fed on milk from tubercular cows.

With these positive evidences on hand is it not reasonable to assume that the likely thing to happen in the human family, when they consume milk from tubercular cows, is to become infected; more especially among young children where the diet consists principally of milk and while their resistance to disease is weak as compared with the adult.

This is a period when we have to protect our rising generation, for on their strength and vitality the future depends. The plague of tuberculosis is worse than war. The losses caused by war are practically limited to its duration, while the losses due to tuberculosis continue year after year and are growing in an alarming proportion.

In the Province of Quebec for the year 1911 there died from tuberculosis 3447 persons, a greater number by far than from any other disease. The practice of Veterinary hygiene and the tuberculin test are the weapons with which to fight the disease energetically and effectually. We should teach and educate the rural population in the art of prevention and in the application of the test so that some day we may be better fortified against it.

Slight progress in combatting tuberculosis is being made. Special credit is due to individual efforts on the part of Veterinarians and farmers.

The intelligent interest of county agricultural demonstrators is strongly commended and it is believed that these should give chief attention in assisting farmers to secure the aid of competent Veterinarians, and when that is not possible they should assist the farmer to take proper remedial measures, always emphasizing the extreme importance of sanitation.

To secure the most satisfactory results there should be the closest co-operation between provincial and federal authorities, and all persons concerned should be willing to suppress their own opinions on relatively unimportant matters, and follow the lead of authorities in the interest of adopting a uniform method for the control of Bovine Tuberculosis throughout the Dominion.

N. E. McEWEN, D.V.S.

CO-OPERATIVE SALES BENEFITTING BOTH BUYER AND SELLER

THE *Rural New Yorker* publishes the following two letters demonstrating the advantage of direct dealing between organized producers of wool and manufacturers by means of an auction sale. By eliminating middlemen both sellers and buyer got a good bargain. The *New Yorker* advocates the selling of apples in the same manner:

The Sellers' View

We have a Sheep Breeders' Association which was organized under the auspices of the Farm Bureau. It now has 46 members. At their last meeting on May 29, a committee was appointed to sell the season's wool crop. All those members present agreed to abide by anything done by this committee. I wrote to a number of men whom I thought would be interested, and as a result five wool buyers met the committee at this office on June 12. The committee was asked to receive sealed bids which they would not do. The wool was sold to the highest bidder. Before we took up the matter, 27 cents was the highest price paid for wool in this county. Bidding began at 31½ and stopped at 36 cents. The association is planning to have a consignment sale of purebred sheep on the county fair grounds October 14, and are also considering the joint purchase of a carload of fencing suitable for sheep fences.

Floyd S. Barlow, Farm Bureau, Manager,
Otsego County, N.Y.

The Buyer's Side of the Bargain

A matter has come to my attention which I deem is of so much importance that I think you ought to know, as it proves in a small way, the value of what you are undertaking in a larger way. My attention was called to it by a representative of a large woolen factory in my town. He was in the market for 30,000 pounds of wool, and he was so pleased with the result of his bargain, saying that he got his stock of wool from the Farm Bureau in Otsego County at a great bargain, and yet the farmer received very much more than he would have got under ordinary circumstances, that it proved conclusively the value of auction sales. His story to me was that he learned of this auction sale of wool and so attended the sale to see what the prospect was. When he arrived he found four or five wholesalers of wool who bid the wool at 32½ cents and there stopped. He as a consumer, knowing that the wool was worth more, bid the 36 cents and got the wool delivered to his factory at 37¼ cents, which he assured me was a large saving over the price he would have had to pay to any of these jobbers if they had secured the wool. You will note by the figures given that the Sheep Breeders' Association netted a saving of $2,700, and from what the factory representative said to me, he felt that he had made a saving of $1,000 or better.

W. N. Giles,
Secretary New York Grange

THE WORLD'S RECORDS FOR BREEDS

Breed	Name of Cow	Age	Lbs. of Milk	Per Cent. Fat	Lbs. of Fat
Holstein	Duchess Skylark Ormsby	Mature	27,761	4.3	1,205.09
Holstein	Tilly Alcarta	Mature	30,452	3.1	951.30
Jersey	Sophy 19th of Hood Farm	Mature	17,557	5.6	999.2
Guernsey	Murne Cowan	Mature	24,008	4.5	1,098.1
Ayrshire	Auchenbrain Brown Kate 4th	Mature	23,022	3.9	917.60
French-Canadian.	Fille	Mature	10,767	4.2	453.

All the above records are held in the United States, except that of the French-Canadian.

PRODUCTION TO CAPACITY

IS the farmer justified in believing that the firm tone of the horse market and the present high prices for live stock rest upon a secure foundation? May he look forward with any confidence to the next season's or next year's market? Should he prepare, as against an advertised shortage and high prices for all classes of farm animals, by breeding a larger number of mares or of cows, sheep, hogs and poultry? We are confident that the farmer has never been in a more secure position than the present, as regards the extension of his breeding operations, but, to enable him to form more easily his own conclusions, the following facts are submitted:

Horses

Since the outbreak of the war, the British Remount Commission has purchased in Canada 15,000 horses. 8,000 have been bought by French contractors and 25,000 by the Canadian Department of Militia. The Department of Militia is now engaged in buying an additional thousand head. The British Remount Commission has purchased over 700 since March and is buying daily in Montreal. French contractors are anxious to obtain supplies and are arranging to buy all that are available both in the East and in the West. It is understood that, as a result of the purchases already made, army buyers are finding it increasingly difficult, both in United States and in Canada, to readily secure the number of horses which they require, particularly of the type suitable for heavy cavalry or heavy artillery.

In addition to the purchases for army account, commercial activity from two distinct quarters has exerted a very evident influence upon the Canadian horse market during the past three or four months. Since the beginning of the year, 6,000 horses reached the Winnipeg Stock Yards from Eastern Canada and 5,917 were shipped from the same yards westward, mostly to Saskatchewan. During the months of January, February and March, 1,805 horses were exported to the United States. A few hundred more went forward to the same market in April. The horses exported were good farm chunks weighing from 1,300 to 1,500 lbs. As high as $500.00 a pair was paid for animals possessing extra quality and conformation. This new movement in the horse market is having its effect upon prices all over Canada.

Buyers report that the better classes of drafters and farm chunks are getting scarce and hard to buy. The same holds true of good big roadsters and saddlers. The noticeable scarcity of good horses of these descriptions illustrates the fact that demand has already overtaken supply and makes it very evident that all the really good sound mares in the country should be bred this year. It cannot be too strongly emphasized, however, that they should be mated only with strictly high class sires. The number of horses rejected by army buyers clearly indicates that there is no place for the unsound horse or for the misfit. Such animals have been, are now and always will be a drug on the market. Breed to the best if you would have the best. Unsound or malformed mares are just as bad as unsound stallions. It is easier to raise a good animal than a poor one. Manage the work this spring in order that the best mare on the farm may be regularly returned to the horse. Next year, a good crop of sound, healthy colts will be as good as a bank account. Canada is likely to enter shortly the commercial export market and that market will require all you can produce.

CANADA'S PROSPECTS IN THE WORLD'S BEEF MARKET

By H. S. Arkell, Assistant Live Stock Commissioner

(From an address delivered at the Ontario Provincial Winter Fair)

THE Honorable Mr. White has stated that the export of munitions and of agricultural and animal products has saved the credit of Canada. What does this mean? The manufacture and export of munitions will continue only so long as the war lasts. The manufacture and export of foodstuffs may continue so long as the world need demands it. It means then that the attention of the whole nation, financially and industrially, is being turned toward the importance of agriculture as a source of national wealth. It means, too, that agriculture has an opportunity to come to its own again in Canada such as has not been given it for many years. It will be the business then of Governments, Federal and Provincial, to give to agriculture better facilities for the carrying out of its business than have hitherto been provided. It will mean that it shall be the business of the whole nation to see that agriculture is in a proper position to yield its full return to the revenues of the country. Our export trade is paying the nation's debts, and that you may understand the extent to which this is the case, I may state that, for the fiscal year 1911-12, agricultural exports amounted to 55 per cent. of the total export business; in 1912-13 to 58 per cent.; and in 1913-14, to 54 per cent., while for the last 10 months of the war to October 31st, 1915, it amounted to 47 per cent. During that same period exports exceeded imports by the amount of $35,600,259.

FOOD, NOT GOLD, NOW IN DEMAND

I suggested a few moments ago that agriculture had an economic mission to discharge in the de-

Horse and Cow Barns of D. T. Ness, Howick, P. Q.

velopment of the country. By building up a great live stock trade, we shall add definitely to the wealth of the country. This can be done better in this fashion than even by the production of gold. The world does not now want gold; it wants food. Of what use is gold to the people of Belgium or Poland or Servia or to the enormous armies of Europe? Gold in exchange, even as payment, for goods is not looked upon with favor. The United States preferred to have payment in bonds or, in other words, in credit. Gold yields no revenue; bonds and credit do. Consequently I need say little more or offer no further explanation in this regard. The world needs food. We are in a position to help produce it. The country needs such an asset as the production of food will allow. I would ask, therefore, that, in considering our whole live stock trade, we do not forget to view it from its economic aspect, in connection with which, by building and developing it as best we can, we discharge an obligation to many suffering human beings, and at the same time to the financial requirements of the country whose name we bear.

OUR PRESENT BEEF EXPORTS

Canada had this year a surplus of cattle for export. This exportation in Eastern Canada consisted in the shipment of 10,679 head to France and of a large number of cutters and canners and a moderate number of high-class export cattle to the local market. The latter went largely into the kosher trade.

In canned and dressed beef we have also exported considerable quantities, canned beef to the amount of 9,620,882 pounds, and dressed beef to the amount of 21,753,672 pounds. The great increase in the export of canned beef has been due to the sale of this commodity to the British Government for army use. Frozen dressed beef, a few shiploads of which have gone and are going forward, has been purchased for the same purpose. The explanation of our having a surplus for export has already been given.

THE BRITISH MARKET

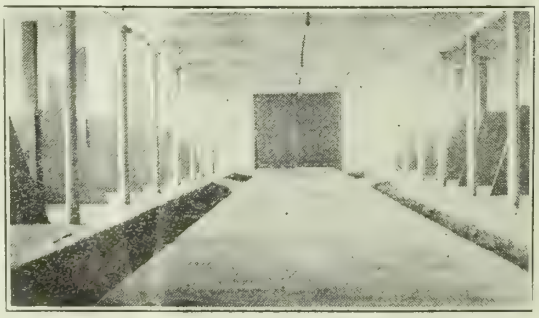
As you are aware, the Department has made the strongest efforts possible to secure the sale of Canadian beef in Great Britain. In this we have been partially successful, and are hopeful that further contracts may be secured. We believe that Canada has now an opportunity to establish an export dressed meat trade such as she may not expect to obtain were we to delay our operations. If Canada lags in the market, other countries will step in and secure the trade against us, to our own great disadvantage in the future. On the other hand, with such a demand as exists at present and may be expected in the future, if we quietly and steadily establish the sale of our meat in European markets, we stand to secure a very profitable share of that trade as it develops.

THE CONTINENTAL MARKET

I need not refer at length to the situation which exists in Europe. In addition to the destruction of her herds in the war zone, France has had to draw from her supply to such an extent as to seriously impair her normal cattle production. The former Minister of Commerce for France estimates that that country will need to import annually at least 200,000 tons of cold storage meat from the present until some years after the war ceases. France has also already made inquiry regarding the purchase of live cattle in Canada to provide for the upheaval of her cattle population. The extent of the destruction of cattle in Belgium does not require comment. With respect to Germany, we have been advised through public channels that the German government is requiring the reduction of its cattle by one-third, in order that the cereal products normally fed to cattle may be available for human use. The Italian market has also been opened up for the importation of meat.

BRITAIN AS A FOREIGN PURCHASER

Great Britain has been largely charged with the purchases of meat for the allied countries. In this connection, she has taken all the available supply in Australia, and her purchases in the Argentine have been such as to impair the quality and reduce the numbers of productive cattle in that country. These purchases have raised the world's price to such an extent that United States and Canada are now able to tender at a profitable figure. In fact, as has already been stated, considerable quantities have already been exported from North America.



Interior of D. T. Ness's stable, showing electric lighting and other modern improvements.

THE SITUATION OF OUR COMPETITORS

The regular sources of supply, then, of exportable meat are apparently unable to meet the demand at a normal price. Little help may be expected for some time from Australia. Drought in that country has greatly reduced the numbers of cattle and the flesh of those remaining to such an extent as to make them unmarketable. Advices from different sources would seem to indicate that temporarily, at least, Australia is dropping out of the market. The Argentine is exporting all that is available, but an increase cannot be expected, as already stated. The demand for meat has trespassed upon the productive power of that country and has appreciably raised the price. In North America our cattle production during the past year or two has been good, and our cattle, during the current year, at least, have gone to the market in good shape. United States admits, however, that she cannot expect to continue an exportation without very greatly increasing her cattle supply. Stockmen in United States have freely stated that Canada was in a better position to quickly provide an exportable surplus, owing to her smaller population and her great natural resources in land and feed. This, then, is our judgment as suggesting Canada's opportunity to establish her trade in meat in the world's market.

The Department is doing all it can to foster this development and is arranging to keep the farmers informed regarding market prospects.

One thing should be said. If Canada provides an exportable surplus, we must expect only to receive an export price. Water naturally finds its own level. If the price is unduly high in one country, trade will turn to another. We must expect, therefore, to meet the competition from the other sources of supply. Clearly production, owing to demand, will be augmented in these other countries, it being clear that they are as alive to the situation as we. When time again adjusts supply and demand, our prices in Canada will naturally fall. We believe, however, that it is altogether unlikely that, for some years, these will go below a profitable basis, and, as already suggested, Canada would seem to be in a particularly favorable position to capture a share of the world's trade to her own great advantage.

INOCULATION FOR STOCK DISEASES

Compared with Stamping Out Methods

THERE is to-day a much stronger feeling in favour of preventive inoculation than there was a few years ago. Considerable advance has been made in this department of veterinary science; and methods seem non available, which then seemed quite impracticable. The British Isles by reason of their insular position are so well adapted to the "stamping out" method, it is not surprising that English and Irish Stock owners view with little enthusiasm the far less radical methods of preventive inoculation. The "stamping out" method, with its promise of making an end once for all of the evil, will always appeal to the practical man; but it has its limitations, it cannot do everything.

The "stamping out" method, whenever it can be successfully employed, is, of course, by far the best, provided it be not too costly. Hence it is desirable to define the circumstances which justify its employment. If the history of the disease gives a reasonable hope of its being stamped out, if the infected centres can be located with reasonable accuracy; if the commercial advantages are worth the price paid for them; and if the country can afford the price, then probably the stamping out method is to be preferred. On the other hand, if the disease has only recently entered the country, or if it is dangerous to human health, this method is always worth trying. In other circumstances it is a waste of money and a waste of time. But even when the circumstances favour "stamping out" there may still be many obstacles in the way. There may be the difficult question of compensation; even sentiment or religious feeling may intervene; and often the operations required by a "stamping out" policy might so upset the business of the stock-owner as to threaten him with ruin.

The object of the authorities should be to devise a means whereby the stock industry may be carried on in spite of disease; and this will often involve a compromise between that which the scientific expert demands, and that which is required by common justice to the man who has a living to earn.

It by no means follows, when we fail to stamp out a disease, that the policy of preventive inoculation is necessarily applicable. It would first be necessary that the method of inoculation should be reliable and practical; and that the material used should be genuine and of good quality, and prepared by competent workers. Generally the method should protect the animal long enough to make its employment a business proposition. Nevertheless, methods which render the animal immune for a very short period, may sometimes be extremely useful; and on the other hand, some are rendered less valuable by the fact that they tend to keep up infection and promote the spread of disease, or even render the animal liable to contract other diseases.

Immunity is conferred either by injecting a prepared serum, by injecting or administering an attenuated or weakened virus, or by a combination of the two methods, the virus being not necessarily weakened. In the case of contagious abortion, large doses of full strength virus alone are given to non-pregnant animals.

Space forbids a detailed account of vaccines and sera and the methods of using them. While the "stamping out" method has its limitations, the inoculation treatment has its limitations also. Moreover, it would often cost a farmer more to cure an animal disease than the animal was worth.

B. C. T.

THE TIME TO ACT

THE old saying has it "there is no time like the present". That this applies with telling force to the selection of good dairy cows, will be admitted by every thoughtful dairyman. Selection may be made on the evidence of certain well known external indications of good milking qualities with special attention paid to the udder, loin, skin, barrel, etc.

But no matter how skilled the expert judge of dairy 'quality' in a cow may be, he is not infallible as to the amount of hard cash that any one cow in the herd will earn in a year. He may be, the ordinary dairy farmer, too, may be considerably mistaken in his judgment. One system will give him accurate results, that of selection of dairy records. It is easy to weigh and sample, it is easy to add up a few figures for each cow, it is easy to compare such totals, and it is eminently satisfactory to know for certain which cows are best to keep and breed from.

Now is the time to act, prepare to keep records all season; write the dairy division, Ottawa, for free milk record forms, either 3 times per month, or daily. You will never regret it.

C. F. W., Ottawa

POISONING BY HORSE-TAIL

EQUISETUM, or what is sometimes called horse-tail, joint grass, or scouring rush, is a very common plant, growing in meadows, and is commonly found in "native hay."

In the minds of many people horse-tail can not be poisonous because it is too common, being more often found in hay than almost any other weed. Reported cases of poisoning are not common, probably for the reason that animals seldom eat enough of it. Most cases reported are from eating the plant in hay, but occasionally horses will wade out into a slough where only the horse-tail grows and eat until they are badly poisoned. In chronic cases of poisoning, which are far the most common, the first evidence of the trouble is a general unthriftiness, soon the animal begins to lose control of its muscles, suffers from cramps and the pulse becomes slow and weak. The legs are cold and the temperature is below normal. The animal finally goes down, struggles violently at times for several days, and finally dies.

No doubt many cases of supposed "swamp fever" have been horse-tail poisoning.

THE DAIRY

THERE IS MONEY IN IT

TO-DAY the prudent farmer hardly dreams of planting seed grain without testing it. He realizes there is on deposit in the Bank of Nature a huge sum of money, much of which may be his, if elementary rules are followed in seeding and cultivating.

The average dairyman with twenty cows may reasonably expect as his share of nature's hoard a yearly income of two thousand dollars if the resultant crops are marketed through suitable cows. But can the unselected, untested cow be expected to take a prominent part in that annual distribution of nature's wealth? She may be fed and cared for to the best of her owner's ability, but there seems to be a loose end if he does not turn round and test her, determine her ability to turn vast deposits in nature's bank into a round nine thousand pounds of milk and leave a clear profit if milk fetches one-twenty per hundred.

Just guessing at seed vitality and power to grow is queer work: guessing at a cow's production and profit is risky and unnecessary. It is very risky because many a dairyman is deceived without the use of scales and test, quite unnecessary because the dairy division at Ottawa supplies, free of charge, milk record forms. Write for them, either the three day per month or the daily kind, with a herd record book. Their use gives certaintly. Test your cows, there is money in it.

C. F. W.

A GREAT CHEESE YEAR

THE cheese exports from Montreal during a period of five years, the average price per box and the approximate value were as follows:

	Quantity Boxes	Price per box	Value
1915	1,851,731	$13.44	$24,887,264
1914	1,482,538	11.07	18,493,179
1913	1,571,165	10.25	16,104,441
1912	1,723,021	10.04	17,299,130
1911	1,810,666	9.84	17,816,953

THE FOOD VALUE OF CHEESE

Cheese at 17c. a pound furnishes, for one dollar, more than twice as much human energy as is obtained from one dollar's worth of beef sirloin at 18c. per pound. There is more than twice as much muscle building food in a pound of cheese as in a dozen eggs. The more general use of cheese as a food will help to reduce the cost of living.

Note the following points about cheese.

(1) Cheese furnishes energy and muscle.

(2) It can be eaten without cooking, or made into a variety of cooked dishes.

(3) Well prepared cheese is practically predigested and can be eaten by any one.

(4) There is less water about dairy products than any other class of foods.

Ask your grocer for Canadian Cheese and insist that it be of good quality. Make up your mind to eat it at least once a day. The Dairy Department at the Ontario Agricultural College, Guelph, has issued a leaflet containing receipts for cheese dishes which will be sent on application.

MILK AND PASTEURISATION

THE time of year is rapidly drawing near when the most desirable conditions for the growth and multiplication of bacteria in milk will present themselves—from the point of view of the bacteria.

The prevailing temperature of late spring and summer is such that the desirability of keeping milk cool becomes an urgent necessity. Unless, however, the milk is produced in the first place with the utmost care from healthy animals and with the greatest attention to detail, the cooling operation alone is not sufficient to warrant any inference that the said milk is good, wholesome, and safe. Until such time as we can feel assured that all cows in the Province are free from disease, it is necessary to ensure the safety of the public, that milk shall be pasteurised either at the farm or immediately it reaches the establishment of the city dealer. With pasteurisation on the farm we will deal at a later date. It is of pasteurisation at the city establishment that we now purpose to treat. That there is a necessity for this pasteurisation there can be no doubt whatever. The city of Montreal may be taken as a perfectly fair example of the conditions prevailing as to the milk supply of the urban districts and centres of the Province of Quebec; and the work done in 1913-14 by Harrison, Savage and Sadler establishes beyond dispute that the bacteriological quality of the milk arriving in Montreal is, with a few exceptions, such that the necessity for pasteurisation is imperative. Some of the leading milk distributors are thus treating the milk at the present time. We are convinced that the practice must eventually spread, and that right quickly, to those who at present are failing for one reason or another to arrange for its adoption. To say, however, that milk is pasteurised, may mean anything or nothing. It is a term which is sadly misued; and to take for granted that because milk is said to be pasteurised it is therefore safe and perfectly wholesome, is about as sensible as it would be for the patient to imagine he will be immune to all the ills of mankind, just because an eminent physician happens to reside in the house immediately round the corner.

Definition

What is pasteurisation? In brief we may say that it is the heating of milk to such a temperature and for such a time as will effectively destroy all disease producing bacteria which may have gained an entrance into the milk; and further, will not impair the unique dietetic or nutritious qualities natural to untreated cows' milk.

European conception

In Germany particularly, and in many other of the countries of Europe, pasteurisation is interpreted as being the heating of milk to a high temperature for a very short time, followed by rapid cooling. As recently as 1914, one of the highest European authorities on the hygiene of milk — Erust — gives a temperature of 185°F. for 30 seconds. Such certainly pasteurises the milk in so far as it kills the bacillus of typhoid, the tuberculosis bacillus, the organism causing intestinal troubles, and others. But, unless consumed within a few hours, such milk tends to putrefy rather than sour normally, owing to the failure of the temperature mentioned to destroy the spore forming bacteria normally found in market milk. These spore formers which are extremely resistent, germinate later, attain once again the vegetative or growing form of the organism, and rapidly multiply. Their multiplication is assisted by reason of the fact that the temperature used has destroyed the desirable lactic acid producing bacteria present in the raw milk; the undesirable strains have little or no competition. It is the heating of milk to high temperature, such as that given above which has provided the ground for the contention that pasteurised milk unless consumed within a stipulated time becomes noxious; and while appearing pure to the eye may be quite unfit for food.

American Conception

Within the last five years or so, the above idea of pasteurisation has been exploded by leading bacteriologists in the United States of America. D. Rosenau, Professor of Preventive Medecine and Hygiene at the Harvard Medical School, has conducted investigations at considerable length, and has promulgated an entirely different philosophy of the process. Ayers and Johnson of the Washington bacteriological laboratories have continued and amplified the work of Rosenau. The method advocated is that of heating the milk at a comparatively low temperature for a longer time. The temperature must be such that it is above the thermal death point—the temperature at which an organism is killed — of the disease producing germs such as tuberculosis, typhoid, scarlet fever, dysentery so on; and at the same time is below the thermal death point of many strains of the beneficial lactic acid producing bacteria. The result of such a system is that after pasteurisation the 'groups' of bacteria surviving are of such nature that some strains of the lactic acid producing organisms predominate; and the milk sours as it becomes aged just as does the raw milk. Moreover this procedure does not affect the flavour, or the nutritive qualities of the milk.

In the most recent literature as the subject, the investigators recommend a maximum of 145°F. for 30 minutes, followed by rapid cooling. This is what we may term the modern conception of pasteurisation. Much work yet needs to be done on milks from widely separated districts, but the system is sound.

In the cities where pasteurisation of milk is enforced by law, the milk must be delivered to the customer within a stated time after having been submitted to the process. No milk may be pasteurised twice. Full particulars must be given on the bottle relative to the temperature used, the time exposed to the given temperature, the date of pasteurisation, and the name of the one responsible for the process.

Pasteurisation without adequate and consistent control is a delusion and a snare, and is provocative of a feeling of false security in the mind of the consumer.

Object of Pasteurisation

The object of the process is not to preserve the milk but to destroy the harmful bacteria. It cannot atone for filth. Milk which is heavily laden with bacteria before pasteurising is unsafe in any case; for products have been formed in the bacteria, which are harmfully assimilated by the system, human or animal. In the words of Rosenau, pasteurisation is an expedient rather than an ideal.

To sum up

A maximum temperature of 145°F. for 30 minutes followed by rapid cooling insures a safe milk, provided the milk has not too high a bacterial count before the process begins. Pasteurisation should be such that it kills any disease-producing bacteria which may be present in the milk; but fails to kill the more resistant strains of the beneficial true lactic acid producing bacteria.

WILFRID SADLER,

Bacteriogical Dept., Macdonald College

POULTRY

PRESERVATION OF EGGS

In the last number of this Journal an article reprinted from the Agricultural Gazette appeared under the above heading recommending exclusively the use of saturated lime water for the preservation of eggs in the spring.

The results of experiments conducted at Macdonald College during the last eight years have been different in several respects, and as these tests were carried out under home conditions, with quantities of 100 dozen eggs and more, it may be useful to give the conclusions arrived at from these tests. We may add that tests conducted throughout the United States confirm the results obtained at Macdonald College.

In general it was found that in order to pack eggs in the spring and keep them throughout the summer and winter water glass was more reliable than lime water. However, eggs packed in the fall in lime water were still in perfectly fresh condition in April of the following year. Lime water is cheaper, more easily prepared than water glass, and cheaper containers can be used, so that for eggs packed in the fall we certainly recommend the use of lime water.

Lime water is prepared as follows:—1 lb. of unslaked lime is dissolved in one gallon of boiled water, the mixture being stirred repeatedly for two days. After the surplus lime has settled and a film or scum has appeared on the clear liquid, the eggs can be put in. It is advisable to keep the liquid at a temperature of about 50°F. Lime water can be kept in any wooden or metal vessel, with or without cover, a new garbage can, an empty pickle barrel, or half an oil barrel being very useful and cheap to procure.

The difference between this lime water packing and the water glass method becomes evident when the temperature of the solution reaches over 65°F., and very few houses have cellars where the temperature does not reach about 70°F. in summer. At 65°F. or over lime water eggs become stale, whilst waterglass eggs hardly show any difference. For this reason it is advisable when using lime water to pack the eggs in September, when the worst heat is over and the nights are quite cool. If a prolonged hot spell should arrive it is a good practice to place a piece of clean ice on top of the solution. This will keep the temperature down and the slight dilution is easily corrected by the dissolving of more lime deposited on the bottom of the container. For the last three years eggs have been treated in this way with remarkable success.

However, eggs gathered in April or May are cheaper and superior in quality to fall eggs, and for this reason when packing eggs in the spring a waterglass solution should be used. To prepare waterglass 1 lb. of chemically pure waterglass syrup is dissolved in one gallon of boiled and cooled water; this solution should be stirred until all the waterglass is dissolved, when the eggs can be put in. The container used must be of stone, or enamelled inside, and provided with a well fitting cover. Six-gallon stoneware crocks cost about $1.50. It is very important to use only the purest waterglass syrup, as most commercial waterglass is of an inferior quality and too alkaline. Order therefore, chemically pure waterglass from a reliable druggist at a cost of about 10c a pound.

The following points should be observed in packing:—

1. Use only naturally clean eggs.
2. Do not try to clean the eggs.
3. Do not pack cracked eggs.
4. Pack only perfectly fresh eggs.
5. Remove the eggs required for use once a week.
6. Replace all loss due to evaporation with clean boiled water.
7. Use the solutions only once.

J. VANDERLECK

EGGS AND MORE EGGS

For many years Canada produced more eggs than we needed and we were able to make large shipments abroad. We kept on increasing our poultry but at the same time our towns and cities were growing in size and the consumption of eggs increased more rapidly than the production. The result was that our exports gradually disappared, and strange to say, agricultural Canada became an egg importing country. People were surprised to learn through the press that shipments came in, sometimes from Russia and frequently from China, two of the greatest egg-producing countries in the world. Of recent years enormous quantities of cold storage eggs from the United States have been brought in to make up for our deficiency. Since the war broke out the foreign supplies for Great Britain have been seriously interfered with. Trade with Russia has been largely cut off. There was, therefore, an opportunity for the shipment of Canadian eggs to Great Britain. In the Patriotism and Production campaign of last year it was stated that there would be a deficiency of 100,000,000 dozen eggs in Great Britain, thus opening up an enormous market to Canada. In addition to the regular consumption there has been an increasing demand for strictly fresh eggs for hospital requirements. The call for fresh eggs has been as insistent as the call for socks and Red Cross funds. Canadian eggs inspected and graded have found a ready market. This market can be held during the war and after the war if we are ready to take advantage of it. Particular attention is given to this question in The Agricultural War Book for 1916. The outlook as to demand and prices is such as to warrant our people in giving careful consideration to it. Thousands of families that do not keep fowls have here an opportunity. Instructions and suggestions are available in every province. The Dominion Department of Agriculture has a number of very valuable bulletins and every Province of Canada has a well organized Poultry Branch ready to give advice. It is a most interesting problem. The United States calculations are that the American hen on the average lays 70 eggs per year. Our Canadian hen, partly from climatic reasons, falls short of this, some calculate by at least 20 eggs. The profitable flock should show an average of at least 120 eggs. The work carried on in developing bred-to-lay fowls and the results of egg-laying contests open up a most interesting field. The record is to-day held by a hen in Delaware. This hen laid no less than 314 eggs in one year. Last year the Canadian hen did her duty, the biggest ever,—she laid eggs to the value of $30,000,000. She can do much better if we give her a chance. There are thousands of families in villages and towns that can keep a small flock at very little expense, thereby serving their own table and helping to increase the exports. Even with eggs we can help finance the war. Meat prices are advancing and the cost of living is going up. Only a half dozen eggs every day will be a great help for the home table. Perhaps, in addition, you can put away half a dozen for use next Fall and Winter.

THE POULTRY RAISER'S OPPORTUNITY

The Present Market Outlook Warrants Greatly Increased Production During 1916

FROM present indications Great Britain will require all the eggs and poultry Canada can produce during 1916. Last year, as a result of greatly increased production, Canada was able to ship to Great Britain the largest quantity of eggs exported since 1902, and at the same time to reduce her imports for home consumption by nearly a million dozen.

Canadian eggs have found favour on the British market, and the prospects are that, providing they are available, much larger quantities will be shipped this year. The unusually high prices prevailing at the present time are largely due to this anticipated export demand.

Prices for poultry are also high, and will likely continue so for the rest of the season. Last fall and winter all the surplus Canadian poultry was exported at highly profitable prices. Between fifty and sixty cars of live poultry were shipped from Western Ontario to the Eastern States alone, and in the Maritime Provinces, particularly in Prince Edward Island, the export demand for canned poultry has greatly enhanced prices to producers.

Although some uneasiness has existed on the part of the trade as regards transportation facilities in view of the high freight rates and the shortage of boats, it is now reasonably certain that an even greater demand for Canadian poultry and eggs will occur this year. It is important, therefore, that every poultry producer take steps to profit thereby, by hatching as many chickens as possible this spring.

Now is the time, by hatching early, to guard against the marketing of so much small, undersized, poorly finished poultry, which annually becomes a drug on the market in the fall of the year. Again it is only by hatching now, and giving the chickens every possible chance to thrive and grow, that a maximum supply of eggs can be obtained in the winter time.

Given their proportionate amount of attention, the growing of poultry brings quick and profitable returns to the farmer. With the increasing cost of meats, milk, butter, etc., there is a constantly increasing demand for poultry and eggs. The labour problem is not critical, as the boys and girls on the farm can readily take care of the poultry. The cost of feed is nominal, prices for poultry and eggs are high, — the highest in fact, for many years. It is obvious, therefore, that Canadians have a patriotic, as well as an economic duty to perform in making the year 1916 the banner year for poultry production in Canada.

THE WORLD'S BEST LAYER

What is the world's egg-laying records? So far as we have authentic records of yield the honour must go to Lady Eglantine, a White Leghorn hen owned by the Delaware Agricultural College. She laid 214 eggs in 365 days.

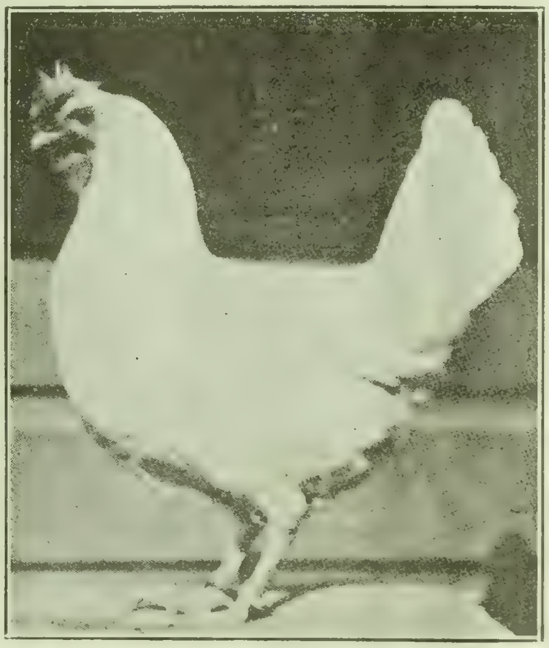
In the British Columbia egg-laying contest, the average number of eggs laid in the year by 240 birds was 165. In the winning pen the average per bird was 223. When we consider that the yield per hen of Canadian farms was only 46 (1911 census) a wide field for practical poultry improvement opens up. It is obvious that like the average cow the average hen is a poor and unprofitable producer. The principles that are being applied in milk production must also be applied to egg production. The hen that does not come up to the standard of profitable performance must be rigidly discarded. Write to the Dominion or Provincial Poultryman for information as to "bred-to-lay" poultry. Your time, chicken food, and eggs are all worth money.

NEW EGG LAYING AND BREEDING CONTEST

A new project of great importance to the poultry industry has taken the form of an International Egg-Laying and Breeding Contest to be conducted by the New Jersey State Agricultural Experiment Station.

It is not so many years ago that a record of 150 eggs per hen anually was considered a good production, but now there are quite a number of hens producing over 300 eggs in one year. On the other hand, the average production of the fowls of the country has increased but little and that increase is more largely due to improved methods of housing, feeding and general management than to improved methods of breeding.

Egg-laying contests have done much to stimulate interest in egg production; in all contests really phenomenal records have been produced, also the average production for all birds in the contests has been remarkable. None of the contests conducted so far, however, have undertaken to determine the breeding value of the birds. This is a very important aspect of the contest work for it is very desirable to know whether a hen will produce daughters that will lay well. This is the principal object in view in the new International Egg-Laying and Breeding contest which will begin November 1st. 1916.



Oregon hen with a record of 303 eggs in 1 year; 512 eggs in 2 years. This hen is worth about five of the average hens of the Province of Quebec.

OBJECTS OF THE CONTEST

The objects of this contest are many. In announcing the same we wish it definitely understood in the minds of all poultrymen that this is purely an effort to improve the methods, and add to the general knowledge of Poultry Husbandry, and it is not antagonistic, in any sense of the word, to any other form of poultry endeavor. The Experiment Station believes that by paying greater attention to the egg producing ability of the birds and methods of breeding therefor we will develop the greatest usefulness in all our varieties. This does not mean that any less attention should be given to the breeding of standard-bred birds or the exhibition thereof, but, on the contrary, this should result in greater interest and greater enthusiasm along both lines.

"Lady Morley" a hen which produced 292 eggs in one year. At an average price of 25 cents per dozen these eggs would be worth $6.08. Under present conditions and prices of feed it would cost about $2.00 per year to feed "Lady Morley". Her profit, therefore, would be about $4.00 per year.

A definite object in conducting this contest is to furnish some authentic and accurate means whereby the poultryman can demonstrate his ability to breed for a high egg production. The breeder of exhibition birds has the ability to demonstrate his efforts by competition in the show room. The egg laying contest and especially the egg laying and breeding contest will allow him to determine and show his mastery of this additional feature of poultry breeding. The contest as planned will provide much interesting data pertaining to the much debated question as to the profitableness of keeping birds during their yearling or second producing season. It will also answer the question whether the first year's production and especially the pullet production during the winter is a fair measure of the total fecundity possible in a given individual. It will also give us much more valuable records, covering the amount, cost and duration of egg production from which very important conclusions can be drawn.

The breeding feature of this contest will provide for the securing of valuable data pertaining to the mode of inheritance of fecundity. The relative value of the male and the female in transmitting to their daughters the power of fecundity will be studied. The great mass of data accumulated from so many breeds and individuals will be of inestimable value in this project. This contest will call to the attention of the poultry producing public the fundamental fact that hens differ materially in their production, and it will point to facts which will enable the determining of the high producing and the low producing hens, which when commercially applied will mean the determining of the profitable and non-profitable birds. This contest will serve the purpose of the poultryman in the same way as the Cow Testing Association serves the Dairyman.

One of the very material objects of this contest is to return to the owner the pedigreed stock, together with records and other data which are unquestionable as to their accuracy. Not only will the original females with a pedigree production of two years be returned to him, but at the end of the contest the pullets or daughters of these hens, with their pullet production, will be returned. In addition the owner will have the cockerel used in the breeding work the second spring, the gametic constitution of which, in so far as fecundity is concerned, will be known. Lastly, this contest will have advertising merits to the contestant that will be of the greatest value. The contest is, however, run primarily for the gaining of knowledge which will give us a better understanding of practical poultry conditions and which when applied commercially will make possible a greater and more profitable poultry industry.

RULES AND REGULATIONS

1.—This competition will be known as the Vineland International Egg Laying and Breeding Contest, conducted by the New Jersey Agricultural Experiment Station at Vineland, N.J. The contest will begin November 1, 1916 and extend for a period of three years, ending October 31, 1919.

2.—The Poultry Department of the Agricultural Experiment Station will have entire charge of the contest. None but those in the regular employ of the Experiment Station will be allowed to carry on the contest. The Superintendent and Foreman will be regular members of the Poultry Staff of the State Agricultural Experiment Station. All records, including eggs laid, weight of eggs, amount fed, duration of moult, frequency of broody periods, etc. will become a part of the regular records of said Experiment Station. These data together with all other data will be published from time to time in the regular reports and bulletins of that Institution. These facts are a sufficient guarantee of the honesty and fairness of the contest.

3.—Each entry shall consist of a pen of ten pure bred pullets; the male bird being supplied by the owner March 1, 1917. The pullets entered must be hatched between the dates of January 1, 1916 and July 1, 1916. The date on which the pullets were hatched must be given in order to add to the experimental data.

4.—The contest shall continue for a period of three years.

5.—The plan of the contest shall be to trap-nest ten pullets in each competing pen for the year 1916-1917 and the year 1917-1918, the latter year being their yearling or second production. During March, April and May of 1918 these hens will be mated to a male bird furnished by the owner, and one hundred eggs from each pen will be hatched in a mammoth incubator and as far as possible ten eggs from each hen will be incubated. The chicks will be brooded in colony brooder stoves. From these birds so hatched, ten pullets, one from each hen in so far as possible, will be selected in the fall of 1918 and from November 1, 1918 to October 31, 1919 these pullets will be placed in the pens occupied by their parent stock, and will be trapnested during the interim. The original pen will be returned to the owner November 1, 1918.

These are but a few of the more important rules and regulations of the contest. Substantial prizes are being offered for the best producing pens and for the various breeds and varieties. Further information will be supplied by Mr. M. A. Jull, Poultry Department, Macdonald College, Que., who is one of the Directors of the contest.

MONEY IN POULTRY

It is gradually being shown that there is good money in poultry keeping. The great trouble with the majority of farmers is that they keep such poor stock that good profits could hardly be expected even under the best conditions of management. But how many farmers are there who give their hens anything like a good chance? In many cases no houses at all or very poor ones are provided, the methods of feeding are erratic and the feeds are of poor quality. To make matters still worse, practically no attention is given to the breeding of the stock. Above all this the average farmer condemns his flock if it is not profitable. Rarely does the farmer know whether his flock is profitable or not, since he keeps no records of the cost of feeding and of egg production. In nine cases out of ten it is the fault of the farmer and not the fault of the flock if it is not profitable. If the farmer would only give the proper attention to his fowls he would find poultry keeping to be one of the best paying departments on the farm. Better methods of housing and feeding will do a great deal to improve egg production and better methods of breeding will accomplish what the other factors cannot.

The following results of various egg laying competitions proves conclusively what may be done through good breeding. The results are obtained from the records of contests held in 1915 from Connecticut to British Columbia. Barred Plymouth Rocks averaged 152 eggs per hen, White Plymouth Rocks 148, Buff Orpingtons 124, White Orpingtons 114, Rhode Island Reds 115, White Wyandottes 156 and White Leghorns 160. Of course, these results were secured from selected pens of birds, but they are the average results of all birds of the various breeds in the contests. They prove conclusively the value of good breeding. The average egg production for the fowls of Quebec is about 50 eggs per hen and this production could be doubled under better management.

Taking the results of all the contests it is found that 2,375 hens laid 359,387 eggs, making an average of 151 eggs per hen for the year. At 25 cents per dozen the value of the average hen's production in these contests would be $3.14, while the value of the eggs produced by the average hen in Quebec at the same price would be $1.04, leaving a difference in favor of the better bred hens of $2.10. The difference in profit is more than is apparent since the Quebec hen would make little if any profit; in many cases she would be a source of loss because it would take more than a dollar to feed her. But supposing it takes $2.00 to feed the average contest hen, and this is a high figure, she would still be making a profit of $1.14 on the cost of two dollars' worth of feed.

M. A. JULL

SEASONABLE POULTRY NOTES

Sell The Old Stock

Just as soon as the breeding season is over, which should be by the first of June at the latest, the old stock should be sold. Select the stock carefully and keep only those birds intended for breeding purposes next season; no birds over one year old should be kept unless of special breeding value. Prices for old fowls are highest early in the season, consequently it is more profitable to sell the hens as soon as possible after the breeding season. The birds may be sold alive or dressed but the former is usually preferable unless there is a considerable difference in price.

Feeding Ducklings

The first feed for little ducklings should be made of a mixture of bread crumbs and rolled oats, using equal quantities of each. Grind the bread crumbs and mix them thoroughly with the oats, then add five per cent clean sand or very fine grit and moisten the whole mixture with milk or water. The grit is very necessary as it helps the ducklings to digest their food. The mash should only be moistened, not made too thin or sloppy. Milk is better than water. Scatter the mash on flat boards and place a dish of fresh water beside the boards. The water dish or fountain should be made so that the ducks cannot get into it. The bread and oat mixture should be used for the first two days, after which a change is made. Be very sure, however, to feed the ducklings just a little at a time, but feed them often. They should be fed about five times each day until they are three weeks old. Beginning the third day, give them a mash composed of equal parts bread crumbs, rolled oats, wheat bran and cornmeal, add ten per cent grit and moisten this mixture as before. When the ducklings are about seven days old use low-grade flour instead of the bread and rolled oats. Remember that the mixture should be damp and not sloppy. Also when the ducklings are about one week old they should be given green food and beef scraps. Fresh grass, clover or alfalfa chopped finely makes a good green food. Add to the mash mixture enough green food to make ten per cent of the ration, and enough beef scraps to make five per cent of the ration. That is, the mash is now composed of seven parts bran, seven parts cornmeal, two parts low-grade flour, two parts green food and one part beef scraps. As the ducks get older use medium grit. After the ducklings are three weeks old they should be fed four times a day. Always keep fresh drinking water before them, but do not allow them to swim.

Produce Infertile Eggs

Every time the rooster crows in the summer it costs the farmer money. If farmers only knew what an expense it is to keep roosters in summer they would soon get rid of them. One rooster on the farm in the summer months will cause the spoiling of many eggs. In warm weather fertile eggs start to hatch and this is the chief source of trouble in the egg market to-day. The selling of partially hatched eggs from the farms is the cause of the loss of several thousand dollars a year. The farmer is largely responsible and he suffers the loss through a decrease in price. Therefore, produce infertile eggs which have much better keeping qualities than fertile eggs. Sell the roosters as soon as the breeding season is over.

Feeding Young Poults

The little turkeys, called poults, should not be fed anything for about thirty-six hours after hatching. For the first week they may be given a mixture of equal parts hard-boiled egg and rolled oats. This mixture should be fed three times a day and it should be in a dry state. Always feed poults on boards, never on the ground. Do not overfeed them. When they are over a week old they may be fed finely cracked corn and cracked wheat, also hulled oats. Give them plenty of free range but always keep them in dry quarters. The hen with the poults should be confined in a coop and the coop should be moved to a new place every day. After the poults get a little old the hen may be allowed to run with them, but they should be fed at home each night. Above all, do not overfeed, give a variety of feeds, give plenty of green food, and keep the quarters dry and clean.

M. A. J.

WOMAN'S WORLD

DUNHAM HOMEMAKERS' CLUB

THE annual meeting of the Dunham Homemakers' Club was held on April 29th at the home of Misses E. L. and N. Baker, the president, Mrs. Yates, presiding.

After considerable discussion the following officers were re-elected for the ensuing year:—

President, Mrs. John S. Yates; Vice-President, Mrs. Dawson Gilbert; Secretary-Treasurer, Miss E. L. Baker; the directors to be appointed at the next meeting.

The Club decided to meet once in two months at the home of members during the year 1916, on a semi-social basis. The advisability of taking up Red Cross work was also discussed.

Several communications were read by the Secretary, and Miss Etta Gilbert was appointed delegate to the annual convention to be held at Macdonald College in June.

A vote of thanks was extended to the President and Secretary for their interest and effort in maintaining the Homemakers' Club at Dunham, the Club fully realizing the great tact and capability of its President, Mrs. John F. Yates, and the efficiency of the Secretary, Miss E. L. Baker.

The Club then adjourned, with an invitation to meet in June at the home of Misses E. L. and N. Baker.

Mrs. DAWSON GILBERT,
Press Cor.

FOODS AND FOOD VALUES

Lesson I

Health Preparedness—The Needs of the Human Body

"STATESMEN and politicians are not the only people who can talk about preparedness. There is a higher preparedness than pertains to armaments and men as cannon food. It pertains to men as efficient factors in the business of living", so says Dr. Frank Crane in a recent issue of the New York Globe.

"Modern folk have hardly begun to apply science to the business of keeping fit. The food question, for instance, has not yet been taken seriously. When one talks to us of fats, proteins, and carbohydrates, we regard him as a mild crank. The old pork and biscuits our grandmother used to make are good enough for us".

"We swill oceans of alcohol, tea, coffee and adulterated soda fountain drinks. We eat quantities of meat; every hotel or restaurant menu is a lurid catalogue of flesh. We smoke and chew tobacco. We transact business in hot, stuffy offices, and pursue recreation in hot, stuffy ballrooms".

"Thus we invite the enemy. We open the gates of hardening of the arteries, derangement of the liver, impairment of digestion, and torpidity of the bowels. We have overworked muscles and overworked kidneys".

"The time will come when we shall arrange for the food upon our table as scientifically (which means simply intelligently) as the physician prescribes for us our pills. And when we shall have employed the doctor as biologist and expert dietitian, we will not have so much work for the doctor as a doser".

Every thoughtful mother must feel and know that this question of health preparedness is a vital one. Without this preparation we cannot be all we should be as mothers. We realize the fact more every day we live. We are anxious that our children should be strong physically as well as morally and intellectually and we realize that "nutrition" is the basis of health.

Feeding the individual

Twenty-five years ago the house-wife and mother could furnish the table according to the dictates of desire and taste. Her only guide was tradition which suffered one food and forbade another, sometimes wisely, often unreasonably. Intelligent feeding is as important to the human being as farm crop and annual, if man is to have a fair chance in the struggle for existence. With two children of like inheritance, the child protected by a parent's knowledge of nutrition has the better opportunity for developing into sound, sturdy manhood or womanhood.

The Human Body has definite work to do and the power to do work must always have some source. The steam engine derives its power from the fuel which is burned in its grates. This engine fuel, however, has not the ability to replace its worn parts, to lubricate, cleanse and repair itself. Its fuel produces heat and energy for work only. The *body fuel is food.* Food for the body must serve a two-fold function.

First—it must build up and repair body tissues.

Second—it must be capable of producing heat and energy for nervous and mechanical work .

How does food build up the body tissues and how is it converted into heat energy and energy for work? *The Body is made up of tissues,* e. g., bony, muscular, nervous, fatty, the blood. These tissues consist of minute cells containing a vital fluid called "protoplasm". The cells are so small that we cannot see them individually with the naked eye, but we know the tissues which represent them. Each cell has its own special work to do, and though its food is brought to it and its waste products removed, it must feed itself and do its own repairing.

The muscles are communities of cells having as their part of the body's work the ability to cause movement.

Bone cells deposit around themselves quantities of mineral matter and give the body a hard substantial framework to support it. In the red marrow of the bones are cells whose purpose it is to form the little red corpuscles which find their way to the blood, giving it not only its red color, but the power to gather oxygen from the lungs. Certain of the cells lining the stomach and intestine and others grouped together into bodies called "glands", manufacture digestive juices which are poured out upon the food and which help to get it ready for the body's use. And so on and on we see this wonderful specialization producing muscle and bone, skin and nerve, until the body stands forth as a whole, in health all its parts working harmoniously and all co-operating to perform the body's work through the power of the cells of the nervous system.

Health means *good condition* of the *cell communities;* disease indicates that some of the cells or groups of cells are not performing their work properly.

Care of the body means care and protection of its individual members—the cells. The whole construction of the body is to serve the cell.

The blood is the vehicle which supplies all the needs of the cells. It holds *in solution* adequate and sufficient food for each cell. It also carries the much needed oxyen. From the capillaries carrying pure blood each bone cell, muscle cell, nerve cell, etc. absorbs through the walls of the capillary and through the cell wall just the substances which are needed for that particular cell; the wastes from each cell pass through the cell wall, through the wall of the capillary and are thus carried away by the veins. How important it is that the blood should contain all the material that each cell requires. In other words good, pure, normal blood is essential to the development and well-being of the human body.

E. B. RUTTER,
Macdonald College.

TOY INDUSTRIES

FOR many years the Canadian Handicrafts Guild has provided for country residents a steady market for the products of the looms. It has obtained for them the higher prices which artistic, individual and painstaking effort should receive, and it has endeavoured to promote ideas and standards leading to these results.

Anything which offers remunerative employment for long winter evenings is an added source of wealth, and the latest undertaking of the Guild should receive hearty support. This latest undertaking is the establishment of a Canadian toy industry—and as the Guild's interests are entirely in the direction of fostering and developing hand-made, as opposed to machine made, articles, it is clear that it claims to reach the homes and hearths of the people. Toys can be made at the fireside by every member of the family who can handle a tool or a paint brush, and the scope for talent and ingenuity is unlimited. Take, for instance, that ancient toy handed down from generation to generation, yet always a new joy to every child who possesses it— the Noah's Ark. The boat itself can be fashioned in many varieties and shapes; Mr. Noah and Mrs. Noah and all the little Noahs, to say nothing of the endless number of animals, can be made according to the fancy of different members of the family, or members of different families who may desire to manufacture some particular beast, bird or person. Other toys which are easily and simply made, and give ample opportunity for the imagination to work, are horses and carts, waggons, sleighs, kitchens, dolls' houses, tops, hoops, soldiers, dolls' furniture, boats and gardening sets.

The toy maker must always remember that the toys are to be placed in the hands of children, sometimes of very little children, and that therefore the paint must be of good quality, for we all know how ready the small hand is to put everything into the mouth, and should the paint be poor, the consequence would be disastrous to the small owner of the toy. Also, the wood used should be hard and smoothly finished, so that, in playing, no splinters will hurt the tiny hands, thus avoiding much unnecessary pain, as well as ensuring long life and happiness to the horse or animal, as the case may be.

The Guild already knows what can be done in toy making from the results of a very successful prize competition held in Montreal last Autumn, which brought out many ingenious toys not only from the Province of Quebec, but from all over the Dominion. The exhibit was visited by thousands of Montreal people, and when the toys were placed on sale they were eagerly purchased in a very few days, the demand being far in excess of the supply.

There are many other articles, not strictly toys, which yet can come under this heading, and which are useful ornaments in every household. For instance, all kind of devices for holding twine, boxes for flowers and stationery, racks for books and magazines, picture frames—all these can be made from wood and decorated in quaint and attractive ways. These, although not included in the competitions, should find a very ready market when they are genuinely hand-made. For it must be remembered that the Canadian Handicrafts Guild stands for excellent quality and good workmanship, and that anything bearing that name has a reputation to live up to.

The Provincial Authorities are giving every assistance to the Guild to make known its aims and work, and application to them or to the headquarters of the Guild in Montreal will bring forth any information wanted.

Encouraged by the success of the first Toy Competition it has been decided to hold others from time to time. Notices were sent out for one closing May 15th, for which the following prizes were offered:—

	First Prize	Second Prize
For best and most original toy made by a returned soldier	$10	
Best Mechanical toy	$5	$3
Most Original toy	$5	$3
Best made toy to sell at $1.00 or under	$5	$3

Toys which have already been awarded a prize by the Canadian Handicrafts Guild are ineligible for further prizes at this Competition.

Besides awarding the above prizes, the following scheme was carried through.

Every entry was passed upon by a Committee of experts, and all toys considered suitable were purchased for cash, and orders for more were given to the contestants for delivery in October.

All toys must be strictly hand-made, and the price must be made sufficiently attractive to make it a commercial proposition. Only in this way will it be possible to build up an industry, which is the aim the Guild has in view.

Every toy must bear a tag or label with the owner's name, and duplicate lists must accompany the entries, with prices duly marked.

INDEX, JULY 1915 TO JUNE 1916 (Inclusive)

TABLE OF CONTENTS

A

Abattoir School at St. Valier, 97
Abbotsford orchards, Some 4
Agriculture, Outstanding Achievements in 205
Agriculture in Quebec, Progress of 163
Agriculture in Rural Schools 108, 116
Agriculture, Short Courses in 119
Agriculture visit Macdonald College, Committee of Council of 24
Agriculture, Wanted Leaders in 24
Agricultural Knowledge and Permanent Agriculture 251, 252
Agricultural War Book, The new 251
Agricultural Awakening in Quebec 143
Agricultural Colleges and Schools, Aid to 164
Agricultural Editor, Death of a great 209
Agricultural Journal of British Columbia 209
Agricultural Merit Competition 1916 209
Agricultural Merit Competition Twentyfifth Anniversary. 97
Agricultural Products in Province of Quebec, Classification of 197
Agricultural Progress, Greatest Enemies of 230
Agricultural Societies, Notice to 119
Air in Water Pipe 55
Alfalfa Crop, The 216, 236
Alfalfa Experiments in Quebec 6
Alfalfa for Dairy Profits 69
Ambulance, A Canadian Blue Cross 9
Amo Milking Machine, The 13
Angora Goat, The 158
Animals, Health of 128
Apples, Box Packing of 25
Apples, Canker of 188
Apples, Cost of a Barrel of 144
Apples, Number Two 185
Apple Orchard, Care of the 211
Apple Orchard, Ten Years Profit from an 121
Apple really an Art, Packing 50
Apple Sirup 79
Apple Trees, Life of 21
Ashes as a Fertilizer 159
Assistance rendered by Dominion Dept. of Agriculture. 171
Atmosphere, Agricultural Conquest of the 206
Auction Sale of Breeding Stock 49
Ayrshire Breeders' Association, Annual Meeting of 194
Ayrshire Bereders' Association, Report of Secretary 194
Ayrshire Breeders' Club at Hemmingford 262
Ayrshire Breeders' Association 239
Ayrshire Heifers for California 220
Ayrshire Field Day, Great 129
Ayrshire in her Native Home, The 108

B

Bacon, What is 173
Bacon Hog Contest 211
Bacon Hog Contest, Rules for 240
Bacon Pigs, Feeding of 196
Bacteria in Frozen Soils 191
Banker-Farmer Convention at Chicago 23
Barrenness in Dairy Cattle, Cause of 242
Bedford District, Some Flocks Herds and Farms of the 57, 84, 106, 128, 172, 193
Bedford School Fairs 103
Bees good Winter Quarters, Give 121
Bees, Introducing Queen 5
Bees, Spring Care of 234
Beef Market, Canada's Prospects in the World's 263, 264
Beef raising in Canada 160
Begonias, Care of 121
Bindweed 191
Boy and Girl, Developing the 186
Boys' Farm at Shawbridge 27
Boys' Prizes at the Internation Fat Stock Show 75
Breeders' Association of the Province of Quebec, General 219
Breeders now, Select your 152
Breeds, The World's Records for 263
British Columbia, Agricultural Journal of 209
British Columbia Coast, A Trip to the 165
Bulbs, Planting 80
Bull, Chronic Bloating of 241
Bulls in good demand, Government pure-bred 23
Business Leaders in Agriculture, Wanted 24
Butter again victorious, Quebec 88
Butter in Quebec, Improvement of Creamery 63
Butter making, The Problem in 88

C

Cabbage in the Field, Storing 101
Cabbage Maggot and Cutworms 254, 255
Calf and Heifer, Rearing of the 240
Candy 134
Carpet Beetle 113
Cattle, Dehorning 20
Cattle, Cause of Barrenness in Dairy 242
Cattle or Warble Fly 23
Cellars, Drying damp 20
Chateauguay Corn Competition 125
Cheesemakers' Agricultural Co-operative Society, Quebec 38, 198
Cheese Year, A great 265
Chicks, Brooding 224
Chicks, Hatching of 199, 224
Chicks, Securing High Fertility for 224
Chicks, Shade and Green Food for 244
Chicks according to Size and Sex, Separate 14
Children, Food for 248
Children's Homer, The 22, 67, 156, 203
Christmas, 1915 119
Christmas Season, The 119
Cider Vinegar 28
Circulars of the Department of Agriculture 75
Circulation of the Journal, The 251
Clover Seed Production 7
Colleges and Schools, Aid to Agricultural 164
Colts, Joint-ill of 241
Compton County, School Fairs in 146
Concrete foundations for farm engines 55
Concrete, Oil-mixed 48
Concrete Tanks, How to build 126
Conventions in Ontario, What Leaders are saying at big 163
Cooking Demonstrations in Schools 247
Co-operative Sales benefitting both Buyers and Sellers 263
Corn, Seed 214
Corn, Rates of planting 257, 258
Corn, Varieties in Quebec 168
Cottonseed Rations 46
Cowansville Homemakers' Club 90
Cows of each Breed, Champion 13, 173
Cows at grass, Does it pay to feed 85
Cow Testing, There is money in 265
Cows: The World's records for Breeds 263
Cow Testing Notes 130, 195, 243
Cow Testing, A seasonable Suggestion 223
Cows, Abortion in 241
Crates, Shipping 41
Cream, Classification of 48
Credit Systems, Rural 163
Creed, The Boy's 273
Crop Competition, Standing 231
Crop, Report on State of the 124
Crop Rotation, Value of 147
Crops, Bulletin on the Appearance of the 27
Cucumber wilt 51
Cultivation, After-harvest 54
Cutworm injury 1
Cutworms, Watch the 259

D

Dairy Costs, Reducing 93
Dairy Herd, Development of the 193
Dairy Products, Testing of 243
Dairying, New Possibilities in 175, 198, 221
Dairying, What Hinders Profits in 181
Dairying, Intelligent Selection in 243
Dairying, Objective Point in 243
Dairying, Turn Waste to Profit 243
Dairying, Winter 115
Dairy Records: The Time to Act 265
Dandelions, Eradication of 19
Dealing with Life and Dealing with Things 94
Death of a great Agricultural Editor 209
Demonstrators, The Work of the County 99
Demonstrators, The Work of the Provincial 156
Deputy Minister of Agriculture, The new 75
Dickson, Death of Rev. H. A. 98, 100
Disease, Water, Air and Food as Factors in 218
District Representatives' Work 164
Divining Rod, The 94
Dog Law, A Satisfactory 209
Dogs and Farm Sheep 60
Drainage Plans, 209
Drainage Questions and Answers 114
Dressmaking, Short Course in 154
Dundas-Grenville Ayrshire Club 238
Dunham Homemakers' Club 133, 269

E

Education, An English Experiment in Rural 232
Education that fits for Life 206
Eggs, Preservation of 266
Eggs and More Eggs 266, 267
Egg-layer, The World's best 267
Egg-laying and Breeding Contest, New 267, 268
Egg, The formation and structure of the 14
Egg Cases and Fillers 223
Egg Circles in Quebec 65
Egg Market, The present condition of the Canadian 152
Egg Production, Winter 132
Eggs in the Home, The Preserving of 14, 65, 246
Eggs and Poultry, Exportation of 201
Eggs, Securing High Fertility in 224
Eggs, Standardizing Canadian 157
Eggs to the Front 201
Ewes, Winter feeding of pregnant 159
Excursion to Macdonald College 30

F

Fair Managers, Suggestions for 88
Fall Notes, Late 101
Farm Enterprise, Diversity of 162
Farm Equipment, The 46
Farm Management 49, 161
Farm of the Future, The School and 250
Farm that was made to pay, One 161
Farm Weeds 31
Farmer, What it is to be a Scientific 115
Farmers' Clubs, Notices re 97, 119
Farmers should be Students 93
Fanning Mill, Importance of the 259
Farm, Learn to live on a 273
Farmers, What we need as 249
Farming for Women as a Livelihood 156
Ferns in the Home, Growing of 146
Fertilizing made plain 26
Fertility, Saving the 169
Field Crops of Canada 7
Fire Blight of Fruit Trees 26, 102, 213
Fish Scrap as Fertilizer 116
Fleas, Ridding a House of 113
Flies, Beware of 45
Flies with Hellebore, Killing 56
Floriculture, Seasonable Notes on 101
Flowers, Annual 249
Fly, Eliminate the 71
Foals, Summer Care of Farm 12
Food Colour Fads 151
Food for Children 248
Foods and Food Values 269
Foods and Food Preparation 15, 43, 66, 91, 112, 133, 154, 203, 225, 247
Forage Plant Tests 113
Forest Fires 52
Founder of Modern Nursing, The 67
Fowls, Health of 109
Fowls for Quebec, General purpose 65
Fruit Crops, Report on 121
Fruit Growing in Quebec, Progress of 145
Fruit, The Failure of Blossoms to set 20
Fumigation for Fungous pests and bad odours, May XI
Fungous pests and bad odours, Fumigating for May XI

G

Garget 35
Goldfish, Care of 179
Grafting, Top 212
Grain Screening, The Importance of 164
Grain Screening, An Experiment in Feeding Commercial 165
Grain, Seed 216
Grasshoppers, Look out for 29
Greetings from Hon. Martin Burrell, New Year 139
Greetings from Hon. J. Ed. Caron, New Year 139
Greetings from Hon. Sydney Fisher, New Year 140
Greetings from Dr. F. C. Harrison, New Year 141
Greetings from Dr. C. C. James, New Year 140

Greetings from Mr. W. F. Stephen, New Year.. 142
Greetings from Mr. G. C. Foster, New Year.. 141
Grenier, the new Deputy Minister of Agriculture, Mr. J. A... 75

H

Handicrafts Guild, Canadian 225
Harvest, The 1915.. 49
Healthy Animals are profit producers, Only 135
Hens, Breaking up broody.. 244
Herd, A Profitable.. 148
Hessian Fly, The.. .. ..33, 113
Hints for September.. 51
Hiving the Swarms 26
Hog Contest, Bacon.. 231
Hog Contest, Rules and Regulations for Bacon 240
Hog House, Portable.. 242
Hogs and the Bacon Industry, The Raising of.. 126
Hogs, Fall trade in.. 172
Hogs for Market, Feeding 173
Hogs, Market requirements and the profitable production of.. 148
Hold-over canker of fruit trees.. 26
Holstein Breeders meet, Quebec.. 192
Holstein Friesian Cows, Official records of.. 59
Homemakers' Clubs, Second Annual Convention of the Quebec 17
Homemakers' Clubs, Quebec.. 248
Homemakers' Clubs and the Rural School.. 18
Horse in Winter, The idle.. 159
Horse-tail, Poisoning by.. 265
Hot Beds and Cold Frames.. 165
Hot Beds, What may be grown in.. 165
Hot Weather Hints for the Stockman.. 35
Howick Farmers' Picnic.. 34
Howick-Huntingdon Ayrshire Breeders' Club.. 238
Huntingdon Agricultural Society, Seed Fair of the.. .. 191
Huntingdon Dairymen's Association.. 222
Hydrated Lime.. 69

I

Ice Supply on the Farm, The.. 167
In-breeding.. 36
Inoculation for Stock Diseases.. .. ..264, 265
Income, The Farmer's.. 19
Insect Pests in Canada.. 254
Inspectors at Macdonald College, School.. 2

J

Jack's Mother.. 136
Journal, The Circulation of the.. 251
Judging Competition, Young Men's.. 12
July Notes in the Garden.. 5

K

Karakul Sheep 85
Keeler, The Illumination of Joseph.. 76

L

Labourer, Be patient with the Farm.. 86
Lambs, Winter Feeding of.. 159
Lawn, Improving the.. 137
Laying Stock, Feeding the.. 176
Laying Stock, Housing the.. 110
Leader gone, A Rural.. 98
Leaders in Country Communities.. 48
Legend, A.. .. ..May XI
Letting One's Self alone.. 273
Library, Quebec Homemakers' Club Travelling 178
Light and Colour.. 204
Lightning, Protect Buildings from 45
Lightning Rods.. 237
Lightning Rods, Home-made.. 237
Lime and Soil 192
Lime of the Soils of Argenteuil County, Need of.. 259
Lime Products, "Fertile" Agricultural.. 257
Liming, The Benefits of.. 259
Litter, Care of the late Winter or early Spring.. 171
Live-stock Breeds, The Strong points of.. 181
Live-stock markets policy, A.. 33
Live-stock Situation in Quebec, Trend of the.. 127
Looking forward 64

M

Macdonald College Announcement 3
Macdonald College, Results of year's work in School of Agriculture.. 3
Macdonald College School of Agriculture Results for 1916.. 253
Machine Milking a necessity 243
Mammitis or garget.. 35
Manure, Value of Liquid.. 70
Manure, Better Care of.. 120
Manure, Application and care of farm.. 12
Manus Milking Machine, The.. 62
Maple Industry, Prospects of the.. .. ..185, 210
Maple Products to Red Cross hospitals, Donations of.. 235
Maple Products now, Dangerous to Adulterate 23
Maple Sugar Schools, Four.. 188
Maple Sweets for the Soldiers.. 188
Maple Sugar and Syrup Co-operative Society, Pure.. .. 121
Mare in Foal, Treatment of the.. 220
Market Problem, The.. 51
Meat in Hot Weather.. 45
Meat Supply, The Farmer's.. 99
Mice and Apple Trees.. 227
Milk and Pasteurisation 265, 266
Milk, Clean 39
Milk, Cooling of.. 39
Milk, Home Care of.. .. .. 22, 40
Milk for Chickens.. 66
Milk, For Cheaper 70
Milk profitably, Producing City.. 62
Milk, Pasteurised.. 174
Milk, The Problem and its Solution.. .. ..108, 175, 197
Milk, Sterilised 151
Milk House, The.. 175
Milk Variety, A Skim 223
Milk, Some observations as to Quantity and Quality of 104
Milking Records of Pure-bred Cows.. 60
Milking Machine, The Amo.. 13
Milking Machine efficient, Is the.. 130
Mineral Elements in Poulty Feeding, The value of.... 41
Money where you lost it, Look for your.. .. .. ..May XI
Morning Glory or Bindweed, Wild 191
Mushrooms and Toadstols.. 77

N

Nancy Wayne of Riverside Third.. 126
New Year, A Happy 142
New Year Greetings.. .. ..139, 140, 141, 142
Notes by the Way.. .. ..232, 252
Notes on our Neighbors.. .. ..77, 99
Nursing, The Founder of Modern 67

O

Oats for Smut, Treating Seed.. 237
One-Crop System, Six Reasons against the.. 259
Orchard, Cultivation in the.. 5
Ormstown Spring Show.. 262
Ormstown, The Sixth Annual Show at.. 11
Ottawa, the City of Gardens.. 254
Overcrowding the Growing Stock.. 65
Overproduction, How to deal with.. 21

P

Packages and Pack, Attractive.. 51
Pastures, Quebec.. 121
Patch, Maud S. and Dan.. 223
Pelargoniums or Geraniums.. .. .. 255, 256
Phosphatic Fertilizers, Importance of.. .. ..May XI
Pigs, Feeding of Bacon.. 196
Pigs, Little Experiment in the Feeding of.. 240
Plant Pests.. 235
Plant Tissues by low Temperature, Killing of.. 52
Plowing and the seed-bed, Deep Fall 46
Plowing Match, Missisquoi 170
Plowing Match, Sherbrooke County.. 123
Plowing Matches.. .. ..75, 82
Pomological Society of Quebec 121, 144
Pomological Society of Quebec, Annual Summer meeting 100
Pork Production 115
Pork, Quebec's Opportunity in the Production of.. .. 143
Porch Boxes, Window and 234
Potash from the Manure Heap, Losses of 113
Potash Fertilizers, How to tide over the temporary shortage of 126
Potato, The 20
Potato, Diseases of the 31
Potato Enemies, Fighting 26
Potato Production, Aids in 118
Potatoes, Degeneration of 228
Potatoes into United States from Canada, Importation of 233
Potatoes belong, To what family do your 160
Potatoes, Powdery Scab of.. 205
Potatoes, Raise your own Seed 213
Potatoes Rotting, Store with Care.. 122
Potatoes, Spraying Experiments with 189
Poultry at the Rural School Fairs.. 111
Poultry Conditions in Pontiac County 152
Poultry Department Extension Work.. 245
Poultry House, Vampires of the 245
Poultry, Seasonable 41
Poultry Feeding, Value of Mineral elements in.. 41
Poultry Husbandry, Officers of American Society of Instructors and Investigators in 64
Poultry, Money in.. 268
Poultry, Seasonable notes on.. .. ..41, 268
Poultry Raisers's Opportunity, The.. 267
Poultry, Prize list for Model.. 89
Poultry, Provide Shade for your.. 65
Poultry for market, Fattening 89
Poultry at Sherbrooke Exhibition.. 89
Poultry required.. 109
Poultry, Profitable breeds for farmers 246
Poultry Queries 244
Poultry Raisers, Free Course to.. .. ..131, 176
Poultry Raising, Quebec's Opportunity in.. 177
Poultry Standards, Dressed 131
Poultry Marketing Associations in Canada, Extension of Co-operative.. 153
Poultry, Twenty Lessons on.. 201
Promoter, Beware the 97
Precedents 180
Preparedness 180
Production to Capacity.. 263
Profitable Production 226
Prospects for 1916 185
Publications of the Provincial Dept. of Agriculture, Valuable 209
Pullets 41

Q

Quebec Fairs, 1915, List of 32, 56
Quebec Homemakers' Clubs.. 248
Quebec Industries and their Encouragement.. 225
Quebec Provincial Exhibition 30
Quebec Society for the Protection of Plants.. 234
Queen Bees, Introducing 5

R

Rat Destruction.. 116
Record of Performance Test.. 36
Records, Dairy (Dan Patch).. 223
Registrations to August 1915 .. .. 166.
Repellents for protecting Animals from the attacks of Flies.. 38
Richmond County, Agricultural Conditions in.. 81
Richmond County, A Leader in.. 105
Root Maggots of Cabbage and Cauliflower.. 4
Roots.. .. .. 54, 122, 170
Root Maggots and their Control.. 255
Roots, Some Pointers for Seeding.. .. ..256, 257
Roots—Which is the best kind?.. 6
Rubber plants, The Care of 102
Rural Community, The Organization of a.. 1
Rural Needs 231
Rural School, The Modern.. 184
Rural School House, The.. 50
Rural Teachers be made Civil Servants? Must our.. 75
Rust in Water Pipes.. 8

S

St. Hyacinthe Dairy School Winter Course.. 108
Ste. Marie of Compton, Mr... 219
School and farm of the future, The 250
School in Scotland, An ideal Rural 186
School Fairs 98
School Fairs in Compton County.. 146
School Credit for Home Gardens and other Home Work 252, 253
Science and Agricultcre.. 50
Scientific Puzzles 69
Search-Lights, The 63
Seasonable Hints.. .. .. 29, 124
Seeweed as Fertilizer.. 76
Seed Corn.. 214
Seed Fair of the Huntingdon Agricultural Society.... 191
Seed Grain.. .. ..170, 216
Seed Grain, New Grades of.. 125
Seed Grain and Potatoes, Distribution of 125
Seed Growers' Association, Eleventh Annual Report of Canadian 104
Seed Growers' Association, Spring Catalogue.. 214
Seed Growing Centres in Quebec 82
Separator with three Cows.. 73
September the Month of Fairs.. 49
Shawville Exhibition 103
Shawville Seed Fair.. 214
Sheep Raising 12
Sheep, Why not more 36
Sheep and Market Lambs, Local Sales of pure-bred.. 57
Sheep at Sherbrooke, Sale of pure-bred 128
Sheep and Dog Law.. 144
Sheep Sales, Local pure-bred.. 148
Sheep Husbandry, Illustrated Literature upon.. 204
Sherbrooke Exhibition.. 80
Sherbrooke Exhibition, Livestock at.. 83
Sherbrooke Exhibition, Poultry at.. 89
Sherbrooke County Plowing Match 123
Sherbrooke County School Fair.. 103
Short Courses by Macdonald College.. 142
Short Courses, Attend the.. 152
Short Courses, Successfcl.. 156
Short Courses in Agriculture.. 167
Silage acid 114
Silage, Making.. 53
Silage moulds, Why 55
Silo insures the Corn Crop.. 57
Silo and ensilage, History of the.. 230
Silver Weed.. 125
Smelt, Fishing for.. 18
Smut, Figuring Loss from.. 216
Soil, Feeding the.. .. .. 258, 259
Soil Tests.. 258
Soil Cultivation, A Study in.. 30
Soils, Fall Treatment of.. 125
Soil Moisture, Conservation of.. .. ..73, 93
Soil Fertility.. 1
Soil Tests for Farmers.. 237
Soil; it feeds us, Feed the.. 8
Soil's Store of Humus, The.. 162
Sows, Fresh Air and Exercise for Brood.. 220

Spraying, Some Important Questions answered in Orchard .. 254
Spraying Problems .. 233
[illegible] Cultivation .. 190
Spring work in the Fields .. 216
[illegible] Hints .. 215
Stable Ventilation, The Importance of .. 49, 59
Stanstead County, Agriculture in .. 9
Standing Crop Competition 1916 .. 231
Statistical Investigation, The Need of .. 71
Step Construction, Simple Concrete .. 171
Stock, Winter Care of .. 159
Stock, Feed, A new and valuable .. 104
Stockbreeders' Association, Sixth Annual Sale .. 127
Stockman, Hot Weather Hints for the .. 25
Storrs, Final Results at .. 153
Story with a Moral .. 184
Subscribers to Journal of Agriculture, Lists of .. 231
Sunshine a Germicide .. 180
Sweet Pea Culture .. 189

T

Tanks, How to build Concrete .. 126
Teacher Training, A new Departure in .. 50
Teachers in Quebec, New Training for Rural .. 157
Timothy Seed Situation .. 27
Toy Industries .. 269, 270
Tomato, The Origin of the .. 71
Tuberculosis and its Control, Bovine .. 262, 263
Turnip Harvesting .. 170

U

Ulysses .. 203

V

Vampires of the Poultry House .. 245
Vegetable Garden, The .. 158
Vegetable Seed Situation, The .. 146
Vegetables, Canning young .. 44
Veterinary Questions .. 174, 219, 241

W

Wallace, Death of Dr. Henry .. 209
Warble Fly .. 23, 185
War Book, The New Agricultural .. 251
Water Supply, The .. 29
Wax for Market, Preparing .. 255
Weeds, The Cost of .. 117
Weeds, Kill the .. 19
Weeds, A good time for killing .. 31
Weeds on Vacant Lots .. 45
Whitewash, How to make .. 55
Window or Porch Boxes .. 234
Winter Care of Stock .. 159
Winter Feeding Hints .. 159
Wisconsin Banks do accounting for Farmers .. 96
Women's Clubs of Quebec, The .. 1
Women, Organizations for Country .. 120
Wool Clip, Improvement of .. 96
Wool, Co-operative Marketing of .. 33
Wool, Exportation of .. 12
Wool Grading in Quebec .. 8
Wool Growers' and Sheep Breeders' Associations, Annual Meeting of Local .. 196
Wool Growers' and Sheep Breeders' Associations, Officers of .. 239
Wool, Prizes for Fleeces of .. 238

ILLUSTRATIONS

Alfalfa Field on Farm of Mr. A. Curtis .. 10
Alfalfa in Rows, A good stand of .. 236
Alfalfa, Winter Killing and a hardy Variety of Grimm .. 217
Amo Milking Machine .. 13
Apples, McIntosh and Fameuse .. 25, 26
Apple Packers at Work .. Ftsp. October
Ayrshire Herd of Mr. George Beach .. 129
Ayrshire Herd of Mr. Hector Gordon .. 222
Ayrshire Herd of Wilton Dryden, Cowansville .. 107
Babcock Test, Students of Macdonald College learning to make .. 243
Baldwin's Jersey Herd, Mr. .. 10, 239
Beach, Barn on farm of Mr. George .. 129
Beach, Poultry house on farm of Mr. George .. 129
Beauceville Maple Sugar School .. 188, Ftsp. March
Bedford district, Map of .. 58
Biscuit, Hot .. 113
Bird fit for the Exhibition, A .. Ftsp. Sept.
Boys' Farm, Shawbridge, The .. 27, 28, 29
Brahmas, A pair of Light .. 152
Brahmas owned by Macdonald College .. 66
Breeder of good vigour, Male .. 152
Brooder or Hover for 50 chicks, Portable .. 225
Bromby, Holstein Herd of Walter .. 128
Brown, Barn of Mr. Otis .. 10
Boving, G. B., Macdonald College .. 251
Cabbage Maggot, Protecting Plants from .. 254, 255
Buckland, Home of Mr. P. B. .. 171
Cairnside Picnic, Group of ladies at .. 35
Cairnside Picnic, Group of men at .. 34
[illegible] Standard .. 90
Candy, Home-made .. 135
Canceolarias and Maiden-hair fern .. 255
Cheese Custard, A .. 44
Cheese Soufflé, Preparation of .. 43
Chicks with Incubator in which they were hatched .. 206
Chicks, Methods of Marking .. 246
Cockerel, Black Orpington owned by Macdonald College. 41
Concrete engine foundation .. 55
Coop for breaking Broody Hens .. 241
Corn Ears, Dent .. 215
Corn, Results of Seeding at various rates .. 257, 258
Corn Ears Flint .. 215
Corn Germination Test Box .. 214
Corn Varieties for Quebec .. 168, 169
Cornstarch Custard .. 202
Cow Testing Scales .. 130
Cranberry Tart .. 154
Creamery, A Model .. 88
Curtis, Herd of Holsteins belonging to Major .. 10
Dairying receives attention at Macdonald College, Practical instruction in Home .. Ftsp. February
Dairy School for Scotland, The .. 109
Dandelion .. 31
Dickson, Rev. H. A. .. 100
Disks for protecting Plants from Cabbage Maggot and Cutworm .. 254
Doughnuts, .. 113
Dunbar, R.G., Melbourne Ridge .. 105
Educational Committee of the Council of Agriculture, The .. 251
Egg-case, A Thirty-dozen .. 65
Egg, Fertile .. 200
Egg, Infertile .. 200
Egg, Structure of an .. 15
Egg Tester .. 200
Eggs for Hatching, Bad and Good Types of .. 199
Excursion party from Sherbrooke and Richmond .. 30
Fish Turbans .. 16
Fungi, Edible and Poisonous .. 77, 78
Ginger Snaps .. 134
Gordon, Ayrshire Herd of Hector .. 222
Grafting Apple Trees .. 212, 213
Greenshields, The Country Residence of Mr. .. 81
Greig, Houseparty at home of Mr. W. .. 143
Grenier, J. A. .. 75
Crowing stock on the Range .. 65
Haddock ready for baking .. 16
Halibut Steak .. 16
Handicrafts Guild, Canadian .. 226
Harrow, Double Cutaway Disk .. 190
Hawley selecting Mangels for Seed Growing, Mr. Clarence H. .. 167
Haying Scene in Eastern Townships of Quebec .. Ftsp. July
Hen, Reproductive organs of the .. 15
Hen, White Cornish .. 132
Hens with Egg-laying Records .. 267
Hen, The Wooden .. 200
Hen, Coop for breaking Broody .. 244
Highland Farm herd, N.P. Emerson & Son .. 106
Highland Farm residence and barn .. 107
Hodge, C.H. and T. H. Biggar .. 82
Hog House, Portable .. 243
Holmes, House and barn of Mr. .. 10
Holstein Herd of Walter Bromby .. 128
Homemakers' Clubs, Delegates to Conventions of .. Ftsp. Aug.
Hook for catching Fowls .. 244
Hot Beds .. 165
Ice House, Sections of an .. 56, 167, 168
Ingredients and utensils together (Cooking) .. 91
Inspectors of Quebec, Protestant School .. 2
Isaleigh Grange, Danville, Que. .. 81
Jersey Herd of Mr. O. A. Baldwin, Coaticook .. 239
Karakul Sheep .. 85, 86
King Segis Ruby Walker .. 128
Legbands for marking Chicks .. 246
Lemon Pie .. 155
Lemon Pudding .. 202
Libby, Brown Swiss Bull belonging to Mr. R. .. 11
Library, Quebec Homemakers' Clubs Travelling .. 178
Lods, Mr. E. A. .. 58
Macdonald College Students learning to make the Babcock test .. 243
Macdonald College Graduating Class in Agriculture, May 1916 .. Ftsp. June
Mangels, Barres-yellow-red .. 7
Mangels and Swedes .. 54
Manus Milking Machine .. 64
Maple Sugar School, Beauceville .. 188, Ftsp. March
Milk House, Flour Plan of useful .. 175
Missisquoi Agricultural Society, Executive of .. 58
Money Maker on the Farm, A .. Ftsp. May.
Moore's Field of Oats, Mr. C. S. .. 193
Moore, Residence of Mr. C. S. .. 194
Muffins, Breakfast .. 90
Mushrooms and Toadstools .. 77, 78
Nancy Wayne of Riverside Third .. Ftsp. December.
Nature Study at Macdonald College, Rural teachers who took the Summer Course in .. 99
New Year Decorations and Greetings .. Ftsp. January.
Ness, Mr. D. T. .. 34
Ness, Barns of Mr. D.T. .. 264
Ness, Interior of Stable of Mr. D.T. .. 264
Nut and Raisin Bread .. 135
Oat Field at Macdonald College .. 53
Ormstown Show, The Live-stock building at the .. 262
Pelargoniums, A fine Selection of .. 256
Pigs, Quality required for Bacon .. 149, 150
Pigweed .. 31
Pinehurst Jersey Herd, Head of the .. 172
Plymouth Rock Cockerel, Barred .. 178
Pomological Society, Members of the .. 101, 144, 145
Poultry Building, Macdonald College .. 152
Poultry house, Ground plan of "Macdonald" .. 110
Poultry, Well finished Roasters .. 132
Poultry Short Course at Macdonald College .. 224
Press, Cider Vinegar .. 79
Pullets, White Leghorn .. 41
Pullets that rest comfortably at Night .. 65
Pumpkin Pie .. 155
Purslane .. 31
Reid, Chateauguay Basin, Home of Peter .. 235
Rhode Island Red Cockerel .. 177
Rhode Island Red Roasters .. 90
Roots, Harvesting .. 122, 123, 124
Ste. Marie, of Compton, Mr. .. 219
Scales for Cow Testing, Spring .. 130
Sheep Sorrel .. 32
Short Course Class in Poultry at Macdonald College .. 224
Short Course Lecturers on Farm Home at Macdonald College .. 179
Shropshire Sheep owned by R. G. Dunbar .. 105
Silos at Macdonald College, Filling two types of .. 53
Slack, Home of Mr. Charles .. 5
Slack, Orchard of Mr. Charles .. 4
Smelts, Fishing for .. 19
Sow and Litter .. Ftsp. May
Sponge Cake .. 133
Sprayer at work in Orchard, Power .. Ftsp. April
Stable Ventilation .. 59
Standish, Brown Swiss Cow belonging to Mr. C. .. 11
Stanstead County, Map of .. 9
Stanstead County, Views in .. 9, 10, 11
Steps, Concrete .. 170
Sugar Bush in Quebec .. 210
Swedes, Bangholm-Olsgard .. 7
Swedes and Mangels .. 55
Swedes, Harvesting .. 122, 123, 124
Sweet Peas .. 189
Taber, Percy W. .. 84
Taber's Cow Clothilde Joan de Kol, Mr. .. 84
Taber's Cow Blizzard Sir Posch, Mr. .. 85
Toad Flax .. 32
Toadstools .. 77, 78
"When the Frost is on the Pumpkin, and the Corn is in the Shock" .. Ftsp. November
White Plymouth Rock .. 89
White Wyandotte Cockerel .. 178
Williams of Knowlton, Mr. H. E. .. 107
Wooden Hen, The .. 210

CONTRIBUTORS

Barton, H. .. 34, 54, 106, 127, 150
Bergey, S. A. .. 65
Boving, P. A. .. 7, 54, 123, 167, 170, 204, 257
Bunting, T. G. .. 4, 26, 234
Campbell, Miss F. .. 90, 113, 134, 202, 225, 247
Editorials .. 1, 2, 3, 23, 24, 29, 30, 49, 50, 51, 75, 76, 77, 88, 97, 98, 99, 100, 119, 120, 121, 139, 140, 141, 142, 143, 144, 145, 163, 164, 185, 186, 188, 209, 210, 231, 232, 251
Gorham, A. C. .. 5, 213
Gray, Margaret .. 22, 67, 157, 203
Hammond, H. S. .. 125, 259
Hanson, A. .. 173, 196
Hodge, C. H. .. 189
Hodgins, R. W. .. 214
Jones, E. H. .. 102, 121, 146, 179, 189, 234, 256
Jones, H. W. .. 6, 26, 255
Jull, M. A. .. 14, 41, 42, 65, 66, 89, 90, 111, 177, 178, 199, 224, 225, 244, 246, 268
King, J. K. .. 104, 146
C. J. L. .. 8, 55, 238
W. L. .. 6, 11, 32, 59, 78, 113, 126, 192, 254
Laird, S. .. 158,186, 233
Lods, E. A. .. 103
MacDougall, W. G. .. 103, 124, 128
McEwen, N. E .. 174, 219, 241, 242, 263
MacLaurin, A. E. .. 171
MacLennan, A. H. .. 5, 51, 165
MacMillan, A. A. .. 8, 106
MacWhirter, Margaret G. .. 19, 136
Moore, C. S. .. 221, 240
Murray, James .. 6, 81, 169, 218, 237
A. R. N. .. 84, 126
Philp, B.M. .. 18, 119, 135
Raymond, L. C. .. 215
Reid, Peter .. 101
Reid, W. J. .. 220
Rutter, Mrs. .. 17,44,67, 155
J. F. S. .. 29, 59, 82, 84, 86, 108, 129, 151, 172, 194
Sadler, W. .. 108, 175, 176, 198, 222, 266
Stephen, W. F. .. 195, 219, 220
Summerby, R. .. 191, 258
"Sylvia" .. 69
A. G. T. .. 89, 153
B.C.T. .. 85, 105, 242, 259, 265
Vanderleck, J. .. 13, 44, 51, 62, 65, 103, 130, 151, 174, 191, 213, 243, 266
Walker, A. H. .. 102

DIAMOND DIAMOND

ST. LAWRENCE SUGAR

HAS LONG SINCE PASSED THE EXPERIMENTAL STAGE

St. Lawrence is not a new or untried sugar, in an experimental stage, but a sugar which has a reputation behind it — a sugar which under the severest and most critical tests, shows a sugar purity of *99.99 per cent., as per Government analysis.* For successful jams and preserves you can always absolutely depend upon St. Lawrence Sugar as its quality never varies. Remember, the slightest foreign matter or impurity in sugar will prevent your jellies from setting and cause your preserves to become sour or ferment.

FOR PRESERVING

It is well worth your while to ask for St. Lawrence Extra Granulated, and to make sure that you obtain it.

Get the original Refinery Sealed Packages, cartons 2 or 5 lbs., Bags 10, 20, 25 and 100 lbs. each.

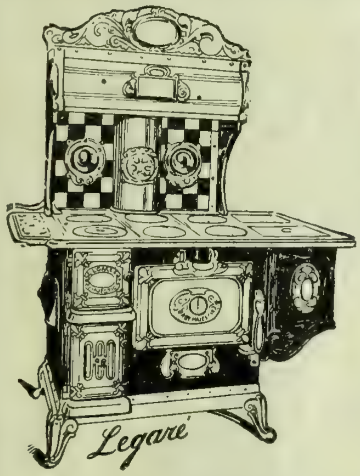
ST. LAWRENCE SUGAR REFINERIES, LIMITED, MONTREAL. 3915

DIAMOND DIAMOND

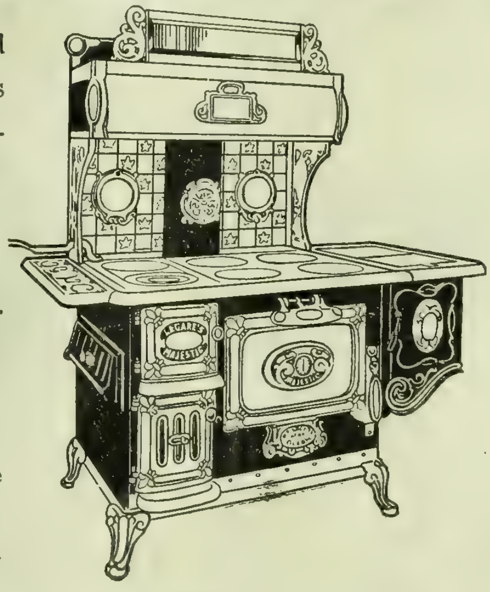
SEE WHAT THE "LEGARE" FIRM OFFERS TO YOU

For the Purchase of a New Range

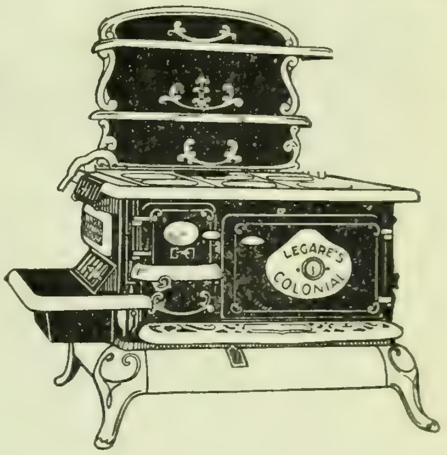
AND YOU'LL BECOME ONE OF HIS BEST CUSTOMERS



As choice and quality, this is the grandiest assortment ever presented to range' buyer.



In prices and terms, we will favor you with the most advantageous conditions.



CAST AND STEEL RANGES

in all styles just to suit your house, your taste and your purse.
As heaters and cookers we give full guarantee.
Our new patterns are real models of perfection and beauty.
For many years, they are giving to thousands of customers, a perfect service.

If you cannot call at our stores, send us this coupon and you will receive our catalogue.

P. T. Legare Ltd.

273 St. Paul Street, QUEBEC.

Branches and agencies, everywhere in the province

Fill in this coupon and address to

P. T. LEGARE
Limited,
QUEBEC.

Gents,
Please send me your free catalogue on ranges and stoves.

Name. . . . .
. . . .
Address. . . . .
J. A. 10-15. . . . .

FREE FOR THE ASKING

This handsome Fur Style Book (containing 34 pages of illustrations) of beautiful

Furs & Fur Garments

We are the largest cash buyers of Raw Furs in Canada, purchasing direct from the trapper. This gives us an unrivalled opportunity to select the very finest skins to manufacture direct into desirable Furs and Fur Garments thus saving the middlemen's profits and enabling us, under our policy of selling

From Trapper to Wearer

to supply the choicest Fur Sets and Garments at marvelously low prices.

Every transaction with us is backed by our thirty years experience in the fur trade, our paid-up capital of $400,000.00 and the largest organization of its kind in Canada.

This is why we can unhesitatingly send out every garment under the following

GUARANTEE

" WE GUARANTEE TO SATISFY YOU OR REFUND YOUR MONEY "

Write to-day for this beautiful Fur Style Book. It will show you how to save many dollars.

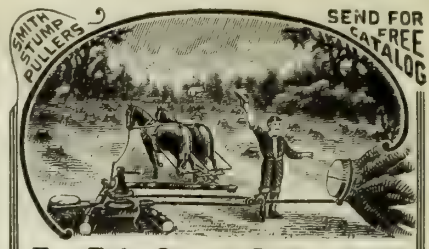
RAW FURS *We pay highest prices for Raw Furs. Write for price list if interested.*

GUNS *We carry in stock a complete line of guns, traps, animal bait, fishing tackle, sportmen's supplies. Catalogue Free.*

John Hallam
Limited

MAIL ORDER "Dept 36"

TORONTO



Try This Stump Puller FREE

We want a Smith machine on every stump and timbered farm in the country: **it will clear from one to three acres a day, pulling the largest stumps and trees quicker than the holes can be bored for dynamite.** The Smith Stump Puller will transform your waste lands into the most productive, while the first crop on one acre will more than pay for the machine.

Our Three Year Guarantee

We give you a guarantee to replace any casting broken on the Smith machine for three years from date of purchase. **Our catalog tells you all about it, shows why the Smith Stump Puller is the most profitable implement made for farm use today, and explains our Special Introductory Offer and our Free Trial Proposition.** Send us your name and we will send it free.

W. Smith Grubber Co.
32 ***Smith Sta., La Crescent, Minn.***

YEARLY SUBSCRIPTION TO THE "JOURNAL OF AGRICULTURE" IS **ONLY $1.00.** IT IS WORTH TEN TIMES THAT AMOUNT TO THE FARMERS' HOME.

Fact to Know When Buying Cross - Cut Saws

The name "Simonds Crescent Ground," on a cross-cut saw means that that saw will cut 10 per cent, more timber, same time and labor being consumed, than any other brand of saw made to-day. This we guarantee.

This is a broad statement, but one which we stand behind.

No saw has yet been returned owing to its having failed to fulfill the above guarantee.

The advantage of the Crescent Grinding, in Simonds' Cross-Cut Saws, is that it prevents binding in the kerf, and enables the operator to push as well as pull the saw—points experienced sawyers appreciate.

Simonds' Steel is the only steel which we are sure will take a temper to hold a cutting edge longer than the ordinary saw.

The illustration shows a Simonds' Cross-Cut Saw, No. 325, with a hollow back, instead of a straight back.

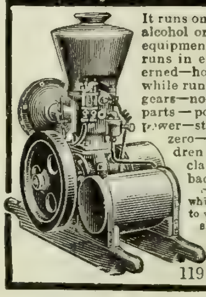
When you buy a saw it will pay you to get a Manufacturer's Brand Saw, with the name "Simonds" on the blade, at about the same price as you will pay for a low-grade Special Saw.

Ask your dealer for the Simonds Cross-Cut Saw, and write direct to the factory for further particulars.

SIMONDS CANADA SAW CO., Limited
MONTREAL, QUE.
VANCOUVER, B.C. ST. JOHN, N.B.

Always buy a saw with a sharp cutting edge—not a soft saw—because the former lasts longer and keeps its edge better.

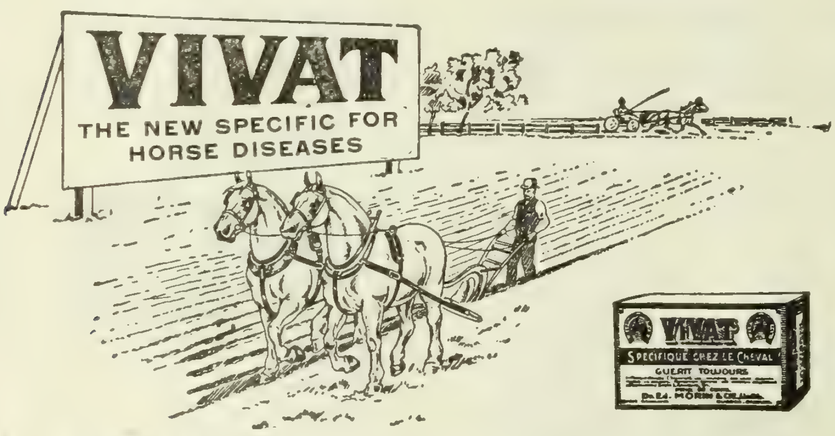
20 Reasons Why You Should Investigate the SANDOW Kerosene Stationary ENGINE



It runs on kerosene (coal oil), gasoline, alcohol or distillate without change of equipment—starts without cranking—runs in either direction—throttle governed—hopper cooled—speed controlled while running—no cams—no valves—no gears—no sprockets—only three moving parts—portable—light weight—great power—starts easily at 40 degrees below zero—complete, ready to run—children operate them—5-year ironclad guarantee—15-day money-back trial. Sizes 2 to 20 H. P.

Send a postal today for free catalog, which shows how Sandow will be useful to you. Our special advertising proposition saves you one-half cost of first engine sold in your county. 602

Detroit Motor Car Supply Co.
119 **Canton Ave., Detroit, Mich.**


VIVAT
THE NEW SPECIFIC FOR HORSE DISEASES
VIVAT
SPECIFIQUE CHEZ LE CHEVAL
GUERIT TOUJOURS
Dr. Ed. MORIN & CIE.

"VIVAT" the specific for **diseases of the horse.** A positive cure for **Coughs, Heaves, Glanders, Asthma** — all diseases which ruin the health of the horse and deprive it of its commercial value.

"VIVAT" fortifies and gives endurance to draught-horses as well as racers.

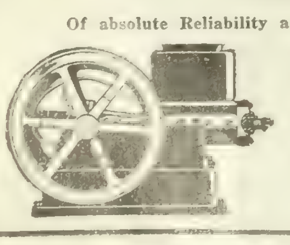
A box of "VIVAT" — at 50 cents — is sufficient for six days' treatment.

Try it and judge for yourself.

DR ED. MORIN & CO., LIMITED, - QUEBEC, CANADA.

A FEELING OF SECURITY

Of absolute Reliability and Power is Enjoyed by Every Owner of a



GILSON ENGINE

"GOES LIKE SIXTY"

A mechanical masterpiece of the highest type, with our improved simple methods of cooling, governing and sparking. Positively guaranteed, biggest value. All sizes. Save money. Ask for catalogue and prices.

GILSON MANUFACTURING COMPANY
17 York Street, Guelph, Canada 33 10

Big Ben

He's Had Farm Experience

On thousands of farms, Big Ben has been the clock of all work—ringing up the people who must get out early, and telling the right time of day to those who stay 'round the house.

Big Ben works 24 hours at a stretch—puts in overtime without extra pay, and never botches up a job.

He's husky, deep-voiced and strong. His call is clear—his bold numerals show plainly in the dim light.

If your dealer hasn't him, a money order addressed to his makers, *Westclox*, La Salle, Illinois, will bring him postpaid. $2.50 in the States—in Canada, $3.00.

"Crown Brand Tastes Like"—

No! there's nothing tastes just like this delicious Corn Syrup.

Its flavor is all its own—just sweet enough—aromatic? if you will—appetizing? certainly—as smooth as cream—with a richness and delicacy to be found in no other syrup. Its uses are legion.

EDWARDSBURG
"CROWN BRAND"
CORN SYRUP

"LILY WHITE" —is a pure white Corn Syrup, more delicate in flavor than *'Crown Brand'* —you may prefer it.

Spread on Bread, it is a meal *the children* delight in. It gives the final touch of deliciousness to Pancakes and Hot Biscuits. It's just what you have always wanted for *Candy-making—for Cooking*—for preparing all sorts of tasty Cakes, Pies, Cookies, and Sauces for puddings.

ASK YOUR GROCER IN 2, 5, 10 AND 20 LB. TINS

The Canada Starch Co. Limited Montreal

4

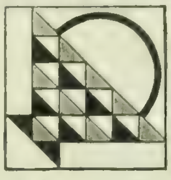
VIGORA
IS INVIGORATING
FOR HORSES

"VIGORA" purifies the blood, restores health, and makes coat sleek and shiny. Best remedy for broken-wind, coughs, glanders, worms, skin-diseases, etc.

PRICE 50c THE BOTTLE.
ON SALE EVERYWHERE.

Get all information from

J. B. MORIN, Wholesale Druggist
QUEBEC, CANADA.



Every quilter should have our book of **450 designs**, containing the prettiest, queerest, scarcest, most grotesque patterns, from old log cabin to stars and puzzle designs, also crazy stitches, also our book of cross-stitch designs, contains hundreds of designs and four complete alphabets for cross-stitch embroidery; very beautiful and easy to do. Both books sent for 25 cents. No stamps accepted.

LADIES' ART CO., Block, 153 St. Louis, Mo.

See this Bow Lever

THIS is a special feature of the Maxwell "Favorite" Churn. No other churn has it. You can adjust the handle to centre, right or left, whichever is easiest for driving.

Maxwell

"FAVORITE" CHURN (with Bow Lever)

—makes churning a pleasure. It's so simple to drive—requires so little effort to produce the butter. Agricultural Colleges and Government Inspectors recommend it. Used in Denmark, Australia, New Zealand, S. Africa, and all over Canada.

Call at your dealer's and let him show you the splendid unique features of the Maxwell "FAVORITE." Sold in eight sizes.

MAXWELLS LIMITED, - - St. Mary's, Ontario.

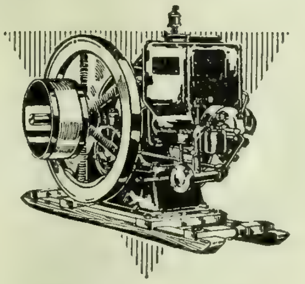
Light rigid steel frame. Bolted trunnions. Roller bearings. Best finish throughout

You save time, labor and money

and increase the earning power of your farm when you own a

Fairbanks-Morse Farm Engine

It will do half your heavy work—better, quicker and cheaper than you can do it by any other means. Simply made—easy to operate—requires but little attention—economical in fuel consumption—durable and reliable—in every respect 35 years of actual use have proven it to be the best farm engine made. Built in many sizes, vertical or horizontal, portable or stationary. Guaranteed.



Type "H", 5 h. p., gasoline

Price, $150

f. o. b. factory at Toronto. less skids.

Send for free booklet, "Power on the Farm". It's full of interesting information for the farmer. Address:

19 Fairbanks-Morse Bldg., any branch.

CFM

The Canadian Fairbanks-Morse Co., Limited
Montreal, Quebec, Ottawa, Toronto, Hamilton, Saskatoon, Calgary, Winnipeg, Vancouver, St. John.

CANADA'S DEPARTMENTAL HOUSE FOR MECHANICAL GOODS

Penmans Warranted High Grade Knit Goods

FOR a sport-coat that gives comfort and cozy warmth, and permits freedom of movement, yet is clearly stylish and distinctive, you want a Penmans Sweater Coat.

Without costing more, the mention of the name "Penmans" brings for your inspection a garment of faultless fabric and cut, knitted to remain permanently in shape, and stamped with unmistakable "class" at every point.

All colors and styles—at all good stores.

119

Penmans
Sweater Coats

"Pedlarize" Your Barns and Other Buildings

G. H. Pedlar

YOU can rest easy if your barns and dwellings are roofed with "George" or "Oshawa" Galvanized Steel Shingles. A roof that is "Pedlarized" is proof against fire, wind and weather. It is absolutely protected against lightning. For more than 25 years we have studied the effects of fire, lightning and tempest—sun, rain and snow—upon our metal shingles on thousands and thousands of roofs in all parts of Canada. From time to time we have seen fit to make an alteration—every alteration has been an improvement—until **now** we can honestly say that **the "George" and "Oshawa" Steel Shingles** are as perfect as human brains and experience can make them.

Pedlar's "GEORGE" Shingle

is the best roofing material we know of for barns and big buildings. It is a great big generous shingle (24 in. x 24 in.). Every "George" Shingle is made to lock on all **Four Sides,** making a roof that is, to all intents and purposes, one solid sheet of steel, which affords absolute protection against snow, rain, fire, lightning, sun or wind.

In one day you can lay a roof of "George" Shingles that would take **three days** to lay in cedar shingles. To cover 100 square feet of surface with cedar shingles would require 1,000 shingles and a small keg of nails—25 of these big "George" Shingles will cover the same surface as 1,000 cedar shingles and you have only 75 nails to drive.

MADE IN CANADA

For your dwelling and smaller buildings, use our "Oshawa" (16 in. x 20 in.) shingle—all the special features of the big "George" shingle, in a more convenient size.

Write for quotations on Galvanized Corrugated Iron Siding or Roofing, Corro Crimp Roofing, Silo Covers, Culverts (rivetted and nestable), Eaves Trough and Conductor Pipe, Finials and Ornaments, Metal Ceilings anything and everything in metal products.

Pedlar's Perfect Products are the best that money can buy. Make us prove it. A post card will bring Free Booklet by return mail. Ask for Catalogue "J.A." Address:

THE PEDLAR PEOPLE Limited
Established 1861
26 Nazareth St., Montreal. Executive Office and Factories, Oshawa, Ont.
Branches:—Ottawa—Toronto—London—Winnipeg.

The Truth ABOUT Leather

How Many Hides Has A Cow?

IN a recent defensive circular to the auto trade, leather manufacturers define leather as "the skin or hide of an animal, or any part of such skin or hide, tanned or otherwise prepared for use."

But since whole hides are too thick for upholstery, and the under fleshy portion must be split away from the grain side to make it thin enough, why should the two or three sheets into which the wastage is split, be called leather? Although artificially coated and embossed to look like real grain leather, these splits are weak, spongy, and soft—they crack, peal and rot.

DU PONT FABRIKOID
TRADE MARK

MOTOR QUALITY FABRIKOID
For Buggies and Automobiles

CRAFTSMAN QUALITY FABRIKOID
For Furniture

Guaranteed far Superior to Coated Splits.

Fabrikoid is guaranteed superior to coated splits. Its base is cotton fabric, twice as strong as the fleshy split. It is coated much heavier and embossed in the same way.

America's largest auto makers adopted it for upholstery because it outwears coated splits.

A leading furniture manufacturer says: "The cheap split leathers should be entirely eliminated in furniture upholstering."

Two-thirds of all "leather upholstery" is weak, flimsy coated splits. Demand the superior Fabrikoid on your car, buggy or furniture, and Fabrikoid Rayntite tops, guaranteed one year against leaking.

Sample of either quality free. Mention your dealer's name. Or, if you send us 50c, we'll mail a large working sample 18 by 25 inches, sufficient to cover a chair, etc. Write us to-day

DU PONT FABRIKOID COMPANY
"Fabrikoid" is made in Canada. Dept. 505 Toronto 2

Furniture, Sewing Machines, and Musical Instruments

Our choice, our prices, our terms and our guarantees make your purchase easy and more satisfactory.

WRITE FOR OUR CATALOGUES:

Very useful for the purchase of household articles.

THE FAMILY KNITTING MACHINE.

Nº1 Legaré

The simplest, the quickest and knitts perfectly all kinds of knittings.

This machine is a source of great savings and gives large profits to all families.

THINK ABOUT IT.

P. T. LEGARE, Ltd.
273 St. Paul St. - - QUEBEC.

WE PAY HIGHEST PRICES FOR RAW FURS

We receive more shipments of Raw Furs than any five houses in Canada

FREE
HALLAM'S TRAPPERS GUIDE French or English
HALLAM'S TRAPPERS SUPPLY CATALOG (Illustrated) and
HALLAM'S RAW FUR QUOTATIONS
worth $50.00 to any Trapper

WE SELL ANIMAL BAIT, TRAPS GUNS &c. AT LOWEST PRICES

Write To-day—Address
JOHN HALLAM LIMITED "Desk 11" TORONTO

GRAND PRIZE

PANAMA-PACIFIC EXPOSITION

Awarded to

DE LAVAL

CREAM

SEPARATORS

as the Highest Award has been at every International Exposition since the invention of the Centrifugal Cream Separator in 1878.

And likewise as at all previous expositions, all higher dairy product awards at San Francisco have been made to users of the De Laval machines.

DE LAVAL DAIRY SUPPLY Co., Limited

MONTREAL PETERBORO WINNIPEG VANCOUVER

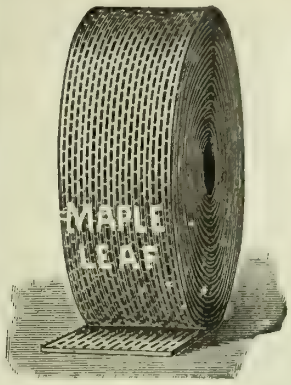
50,000 BRANCHES AND LOCAL AGENCIES THE WORLD OVER

Yearly Subscription to the JOURNAL OF AGRICULTURE

IS

Only $1.00.

It is worth ten times that amount to the farmers' home.



"MAPLE LEAF"

Stitched Cotton Belting

A BELT that is the most economical, truest running and strongest belt on the market. Being thoroughly waterproof it is particularly well adapted for general farm use such as threshing machines, gasoline engines and other farm machinery. Also suitable for saw mills, flour mills, etc.

ASK FOR "MAPLE LEAF" BELTING
IT IS CHEAPER THAN RUBBER OR LEATHER BELTING.

DOMINION BELTING CO., LIMITED
HAMILTON, ONT.
Montreal Office:—50 Notre Dame Street W.

GOLD DUST

MADE IN CANADA

—it actually works at hundreds of tasks daily

"Let the Gold Dust Twins do your work" is much more than a popular phrase. It is based on truth, an actuality, for Gold Dust really *works*.

"Let the GOLD DUST TWINS do your work"

The millions of women who use it for dishwashing and scrubbing know this.

But Gold Dust should be used for cleaning and brightening *everything*.

It is the only washing and cleaning powder needed in any home.

The small quantity required is quickly taken up by hot or cold, hard or soft water—forming a perfect cleaning solution. The valuable antiseptic cleansing agent it contains helps to make things sanitarily clean, as well as bright and new-looking.

5c and larger packages sold everywhere

THE N.K. FAIRBANK COMPANY
LIMITED
MONTREAL

Ready for the fair.

Every activity on the farm is worth a

KODAK RECORD

The growth of stock and crops, the condition of orchards and buildings, the things you see at the fair, at the farmer's institute—the Kodak can help you get value received from every one of them.

And its capacity for increasing your enjoyment of your auto trips and other outings is equal to its value in a business way.

Ask your dealer or write us for our illustrated booklet, "Kodak on the Farm." It's free.

CANADIAN KODAK CO., Limited, 604 King St. W., Toronto.

Saved ! !

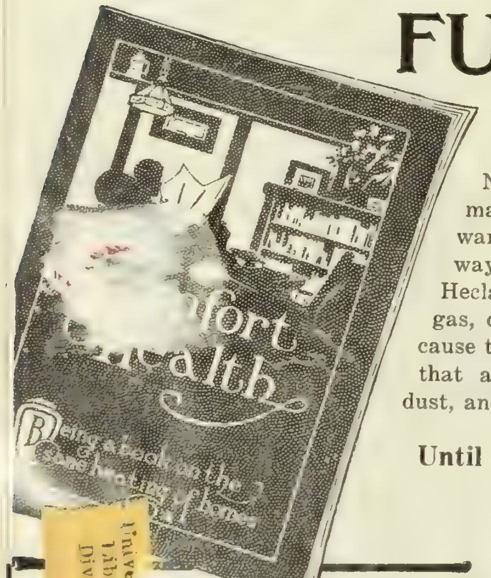
"That little Booklet was right. It said we would save one ton in seven — and there's the coal to prove it."

There's nothing surprising about this. The Hecla has a firepot that saves coal because of its triple heating surface. This firepot is ribbed with steel flanges. Every winter thousands of Hecla Furnaces prove that the Steel Ribbed Firepot gives greater heat from the coal.

Every winter Hecla owners are able to reckon a big saving in coal because of this patented Firepot.

The reasons are clearly shown in our Booklet.

HECLA WARM AIR FURNACE


Comfort and Health
Being a book on the home heating of homes

**Clean Air
Healthful Heating**

No matter how long you may use a Hecla Furnace the warm air it supplies will always be pure and mellow. The Hecla guarantees air free from gas, dust, and soot. This is because the Hecla has Fused Joints, that are forever sealed against dust, and gas.

Until You Read This Book

you will never know the utmost in heating with a warm air furnace. We will send a copy free to anyone interested, and will answer questions or give advice on any heating problem.

Coupon

Cl[illegible] & Co., Limited, Preston. Se[illegible] Booklet "Comfort and [illegible]."

. . . .

. . . .

Write to-day

**CLARE BROS. & Co.
Limited, Preston**

Start 'em Hunting the Nest

PULLETS will start laying early by proper feeding. You can also feed hens so as to hurry them through the moult and make them active layers.

By correct feeding you can get your flock laying weeks ahead of your neighbors'. This, thousands of poultrymen have proven. They feed now to get eggs in November and December, when prices run to 50c and 60c a dozen. And you can get your hens to pay you just as well if you watch the health of your flock during the heavy feeding for egg production.

Pratts Poultry Regulator makes feeding for eggs safe and profitable. The hens are kept active and healthy. They start laying early and lay right through the winter.

At a cost of a cent a hen a month you can turn the entire flock into good layers. You get more eggs or your money back. Prove it at our risk with

Pratts *POULTRY Regulator*

25c, 50c *and* $1.00 *packages and larger money-saving sizes up to 25-lb. pails at* $2.50.

SOLD AT ALL DEALERS ON OUR MONEY BACK GUARANTEE.

You feed for eggs. The cost of feed is not *so much per hen* but *so much per dozen eggs.* On this basis, your feeding bills can be greatly reduced, by simply adding Pratts Poultry Regulator to the ration, *because you will get more eggs—at the high price per dozen.* Think this over.

Pratts Poultry Regulator greatly increases the egg-producing value of all feed.

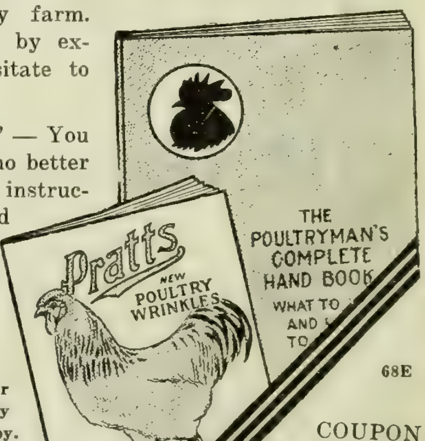
PRATT EXPERTS WILL HELP YOU

It is our desire to help amateurs and professionals alike to keep their flocks paying. To make our advice practical, we maintain the Pratt Experiment Station, a 100-acre poultry farm. Every letter is answered promptly by experts, without charge. Do not hesitate to write.

"POULTRYMAN'S HANDBOOK" — You would pay $1.00 for a poultry book no better than this one. 160 pages of clear instructions, 150 illustrations; how to build modern poultry buildings; how to feed for profit. Answers the puzzling questions that come to both beginners and experienced poultrymen. Send ten cents for a copy postpaid.

"POULTRY WRINKLES" — A sixty-four page book of real live ideas to use every day in the year. Mail the coupon for a free copy. You miss something every day you wait.

Pratt Food Co. of Canada Limited
68E Claremont Street, TORONTO.



68E

COUPON

Pratt Food Co. Ltd,
TORONTO

Send "Poultry Wrinkles" Free.

. . . .

UNIVERSITY OF ILLINOIS-URBANA

3 0112 058712644